



Babcock & Wilcox

ADDENDUM TO: MAGNESIA
BASE WET SCRUBBING OF
PULVERIZED COAL
GENERATED FLUE GAS -
PILOT DEMONSTRATION

RESEARCH AND DEVELOPMENT DIVISION
RESEARCH CENTER ALLIANCE, OHIO

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ADDENDUM TO:

MAGNESIA BASE WET SCRUBBING OF PULVERIZED COAL

GENERATED FLUE GAS - PILOT DEMONSTRATION

PROJECT SPONSORED BY NATIONAL AIR POLLUTION CONTROL ADMINISTRATION

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I. INTRODUCTION

The purpose of this addendum is to present a complete record of the data obtained under Contract CPA-22-69-162 for the National Air Pollution Control Administration. The computer program, all the computer printout, and summaries thereof are included.

II. COMPUTER PROGRAM

This program written in Fortran IV for an IBM 360 digital computer catalogs all the input data and performs all the necessary computations. The program is straightforward except for one factor. If not data is inputted for a particular item, or if insufficient data is inputted to compute an item, that item assumes a value sufficient to flood the field thereby yielding the symbol *****. This was done to eliminate confusion between an item which actually is zero and one which merely was not measured.

```

// EXEC F44GO,PARM='NS,E,GT=75,G0,Q,FN=3K,LC=58'
//FORT.FT01F001 DD UNIT=SYSDA,SPACE=(52,(500,10))
//FORT.SYSIN DD *
C MGO SLURRY SCRUBBING,FURNACE CALCULATIONS
  DIMENSION A(20),APH(20),AS(20),AP(20),AWB(20),DL(20),DDG(20),
1 DWG(20),FDGW(20),FAGW(20),FLV(20),FLW(20),HG(20),HFG(20),
2 PD(20),PSG(20),PSL(20),PV(20),PVE(20),PIG(20),SGRAV(20),
3 SD2(20),S03(20),TG(20),TL(20),TD(20),TWH(20),TGS(20),
4 XFA(20),XMG(20),XMG(20),XMGCH(20),XS03(20),XS04(20),XUSUL
5 (20),NOX(20),PDL(20),FILTI(20),FILTF(20),VOLN(20),PSGH(20),
6 TGM(20),VULMS(20),XMMWG(20),FWGV(20),TSG(20),ICARD(40),
7 RANGE(20),RRANGE(20),CORVF(20),CONF(20),DDGBI(20),DDGBE(20),
8 DDGHT(20),PSBI(20),TGBART(20),PDBI(20),PDBE(20),FDGWHI(20),
9 FDGWBE(20),FDGWT(20),FDGVBI(20),FDGVBE(20),FDGVBT(20),
A FCORBI(20),FCORBE(20),FCORBT(20),SD2BI(20),SQ2BE(20),
B COEF(20),CHART(20),BLANK(20),TBART(20),CCEFF(20),
CPVEVAC(20),PVANAL(20),TEVAC(20),TANAL(20),GMASSI(20),GMASSF(20
D),GMASSS(20),VFLASK(20),PSEVAC(20),PSANAL(20),PBA(20),NO2MU(20
E),NO2MA(20),PSS03(20),TS03(20),VS03(20),METCOR(20),MS03(20),
F DDGS03(20),GS03(20),CORRM(20),SAVE(5)
  REAL NUX,NITRIN,LGVP,LGVV,LGVF,LGWP,LGWN,ML3,ML7,ML10,
1 ML31,ML3F,ML101,ML10F,MAGFLD,
2 GMASSI,GMASSF,GMASSS,NO2MO,NO2MA,GSU3,MS03,METCOR
3 MTOTI,MTOTF,MASTGT,MFAI,MFAF,MASFA,MPFAI,MPFAF,
4 MASPFA,LGWVS,LGWFS,KGAVEN,MONMDL,KGAFBA,MGMOL,MONDMA,
5 MONSFA,MGCMAS,MGO,MONO,MGOD,MONOD,MONOS,MAGN,MONDMO,
6 MONSMO,MGMOL
  DOUBLE PRECISION IRUN,IDATE
C PRODUCT FLOW ORIFICE COEFFICIENT
  COEF(1) = 1.860
  COEF(2) = 0.767
  COEF(3) = 0.397
  COEF(4) = 0.560
C SPRAY NOZZLE COEFFICIENT
  COEFF(1) = 82.3
  COEFF(2) = 27.1
  COEFF(3) = 8.60
  COEFF(4) = 63.4
  COEFF(5) = 31.5
  COEFF(6) = 126.0

```

C OPERATING RANGE FOR BARTON TITRATOR

RRANGE(1) = 0.10
RRANGE(2) = 0.30
RRANGE(3) = 1.00
RRANGE(4) = 3.0
RRANGE(5) = 10.0
RRANGE(6) = 30.0
RRANGE(7) = 100.0

C CONVERSION FACTOR RELATING BARTON RANGE TO CONC.

CONVF(1) = 0.034
CONVF(2) = 0.099
CONVF(3) = 0.320
CONVF(4) = 0.920
CONVF(5) = 2.80
CONVF(6) = 8.20
CONVF(7) = 28.0

C BARTON CELL COEFFICIENT

CELLC = 1.0

C COAL ANALYSIS

XCC = 0.7150
XHC = 0.0485
XCC = 0.0817
XNC = 0.0
XSC = 0.0370
XWC = 0.0438
XAC = 0.0740

C NATURAL GAS ANALYSIS

YN2NG = 0.0050
YCO2NG = 0.0075
YC1NG = 0.9500
YC2NG = 0.0305
YC3NG = 0.0070
YU2NG = 0.0

C SULFUR COMPOSITION IN NATURAL GAS, GRAINS/100 SCF

XSNGV = 0.023

C PRELIMINARY CALCULATIONS

C

C MOLECULAR WEIGHT NATURAL GAS

C

XMWNG = YN2NG * 28.0 + YCO2NG * 44.0 + YC1NG * 16.0 + YC2NG *

C	1	30.0 + YC2NG * 44.0 + YC2NG * 32.0
C		SULFUR CONCENTRATION IN NATURAL GAS, # SULFER/# NAT.GAS(S FREE GAS)
C		XSNG = XSNGV* 359.0/XMWNG/7000.0
C		OXYGEN CONSUMED BY COAL, #/# COAL BURNED
C		O2COAL = XCC * 32.0/12.0 + XHC * 32.0/4.0 + XSC - XOC
C		OXYGEN CONSUMED BY NAT. GAS, #/# MOLE NAT. GAS BURNED
C		O2NGAS = YC1NG * 44.0 + YC2NG * 112.0 + YC3NG * 160.0 -
C	1	YC2NG * 32.0
C		CO2 FORMED FROM NATURAL GAS, #/# MOLE NAT.GAS BURNED
C		CO2NG = YCO2NG * 44.0 + YC1NG * 44.0 + YC2NG * 88.0 +
C	1	YC3NG * 132.0
C		H2ONG = YC1NG * 36.0 + YC2NG * 54.0 + YC3NG * 72.0
C		NORMAL COMPUTER INPUT OR FIXED INPUT ITEMS
C		HEATING VALUE OF COAL
C		HVALC = 12730.0
C		HEATING VALUE OF NATURAL GAS
C		HVALNG = 1039.0 * 359.0/XMWNG
C		HEAT OF FORMATION COAL BOMB PRODUCTS, BTU/# DRY COAL
C		HFBPC = (1.8/(1.0 - XWC)) * ((XCC/12.0) * (-94052) + (XHC/2.0
C	1	+ XWC/18.0) * (-68317) + (XSC/32.0) * (-70960))
C		HEAT OF FORMATION COAL,BTU/#DRY COAL AT TEMP = 25 C
C		HFCOAL = HVALC + HFBPC
C		


```

C      HEAT OF FORMATION OF NATURAL GAS BOMB PRODUCTS, BTU/#NATURAL GAS
C
      HFBPNG = 1.8 * (CO2NG * (-94052.)/44. + H2ONG * (-68317./18.)
      1 + XSNG * XMWNG * (-70960./32.0))/XMWNG
C
      HEAT OF FORMATION OF NATURAL GAS, BTU/# NATURAL GAS AT TEMP = 25 C
C
      HFNGAS = HVALNG + HFBPNG
C
      INPUT DATA
C
      1 DO 1500 I = 1,18
        PSG(I) = 0.0
        FWGW(I) = 0.0
        1500 FDGW(I) = 0.0
        NNN = 0
        READ(5,5,END=3100) IRUN, IDATE, ITIME, PSG(1), PD(1), PSG(4), PD(4)
        5  FORMAT(A8,1X,A8,1X,A4,1X,F7.0,1X,F9.0,1X,F9.0,1X,F9.0)
        READ 10, ICARD(2), PSG(5), PDH, PSGF, PSG(18), PD(18), PSG(6),
        1 PDPS, PSPS
        10 FURMAT(12,1X,F7.0,1X,F9.0,1X,F9.0,1X,F9.0,1X,F9.0,1X,F9.0,
        11X,F9.0)
        READ 12, ICARD(3), FNGSTP, PSG(3), SPEED, YO2D, YCOMB, VMV, TCELL,
        1PB
        12 FURMAT(12,1X,F7.0, 1X,F9.0, 1X, F9.0, 1X,F9.0, 1X,F9.0,1X,F9.0,1X,
        1 F9.0, 1X, F9.0)
        READ 15, ICARD(4), PSL(2), PLPART, PSL(9), PLPMGU, PDLMGO, KKK,KKI
        15 FURMAT(12,1X,F7.0,1X,F9.0,1X,F9.0,1X,F9.0,1X,F9.0, 1X, 11,9X,11)
        READ 17, ICARD(5), TG(4), TGWHT, TGWBW, TGWBB, TGWBE, TGB1, TGB2,
        1 TG(6), TG(1)
        17 FURMAT(12,1X,F7.0, 1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0
        1,1X,F7.0,1X,F7.0)
        READ 20, ICARD(6), TG(7), TG(9), TG(10), TAH1, TAH2, TG1,
        1 TWB(1), TG4, TWR(4)
        20 FURMAT(12,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0,1X,7X, 1X,F7.0,
        11X,F7.0,1X,F5.0, 1X, F7.0)
        READ 22, ICARD(7), JJJ, PSG(7), PDP, PDPC, PSG(9), PD(9)
        22 FURMAT(12,1X,11,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0)
        READ 25, ICARD(8),PDV, PDVC
        25 FURMAT(12,1X,F7.0,1X,F7.0)

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READ 27, ICARD(9), PSG(10), PUF5, PUF, PDFME
27 FORMAT(12,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0,1X,F7.0)
READ 30, ICARD(10), TG9,
1 TL(10), TL(7), TLST, TL(4), TL(1)
30 FORMAT(12,1X,F5.0,1X,F5.0,1X,F5.0,1X,F5.0,1X,F5.0,1X,F5.0,1X,F5.0,
1 1X,F5.0,1X,F5.0,1X,F5.0,1X,F5.0)
READ 32, ICARD(11), TGT9, TGT17, TLT3, TLT10, TLT7, TLTST, TLT4
32 FORMAT(12, 1X,F5.0, 1X, F5.0, 1X,F5.0, 1X, F5.0, 1X,F5.0, 1X, F5.0, 1X,F5.0, 1X, F5.0,
1 1X,F5.0)
READ 33, ICARD(12), VLI1, VLI1F, TIME1, VL81, VL8F, TIME8, MAGFLO,
1 CONROL
33 FORMAT(12,1X,F7.0,1X,F9.0,1X,F5.0,1X,F9.0,1X,F9.0,1X,F5.0,1X,F5.0,1X,F7.0,
1 1X, F5.0)
READ 35, ICARD(13), III, PSL(3), IIJ, PSL(10), HIGHT, YD21, YD2E
35 FORMAT(12,1X,11,1X,F5.0,3X,11,1X,F5.0,1X, F9.0, 2F10.0)
READ 37, THURBT, THORBE, PDTHO, PSTHO, TGTHO, TIMET
37 FORMAT(21X,F9.0,1X,F9.0,1X,F9.0,1X,F9.0,1X,F9.0,1X,F9.0, 1X, F9.0)
READ 39, XMG0(4), SLKPCE, SLKPCM, DL4, APH(4)
39 FORMAT(21X,5F10.0)
READ 40, BACLE, VBACL, VBACLF
40 FURMAT(21X,3F10.0)
READ 41, TOTAL, FREE, TOTALD, FREED
41 FURMAT(21X,4F10.0)
READ 42, MTOTI, MTOTF, VOLTOT
42 FURMAT(21X,3F10.0)
READ 43, MFAI, MFAF, VULFA
43 FURMAT(21X,3F10.0)
READ 44, DL10, APH(10), DL7GAG, CONDOC
44 FURMAT(21X,4F10.0)
READ 47, MPFAI, MPFAF, VGLPFA, APH(3), DL(3)
47 FURMAT(21X,5F10.0)
PRINT 2102
PRINT 2104, IRUN,
1 ICARD(2),
2 ICARD(3)
PRINT 2105, IDATE,
1 PSG(5),
2 FNGSTP
PRINT 2106, ITIME,
1 PDB,

```

2 PSG(3)
PRINT 2107, PSG(1),
1 PSGF,
2 SPEED
PRINT 2108, PD(1),
1 PSG(18),
2 YO2D
PRINT 2109, PSG(4),
1 PD(18),
2 YCOMB
PRINT 2110, PD(4),
1 PSG(6),
2 VMV
PRINT 2111,
1 PDPS,
2 TCELL
PRINT 2112,
1 PSPS,
2 PB
PRINT 2113
PRINT 2114, ICARD(4),
1 ICARD(5),
2 ICARD(6)
PRINT 2115, PSL(2)
PRINT 2116, PLPART,
1 TG(4),
2 TG(7)
PRINT 2117, PSL(9),
1 TGWBT,
2 TG(9)
PRINT 2118, PLPMGD,
1 TGWRW,
2 TG(10)
PRINT 2119, PDLMGD,
1 TGWBB,
2 TAH1
PRINT 2120, KKK,
1 TGWBE,
2 TAH2
PRINT 2121, KKI ,

1 TGB1,
2 TGI
 PRINT 2122,
1 TGB2,
2 TWB(1)
 PRINT 2123, ICARD(7),
1 TG(6),
2 TG4
 PRINT 2124, JJJ,
1 TG(1),
2 TWB(4)
 PRINT 2125, PSG(7)
 PRINT 2126, PDP,
1 ICARD(8) ,
2 ICARD(9)
 PRINT 2127, PDPC ,
1 PDV,
2 PSG(10)
 PRINT 2128, PSG(9),
1 PDVC,
2 PDFS
 PRINT 2129, PD(9) ,
1
2 PDF
 PRINT 2130,
1
2 PDFME
 PRINT 2131
 PRINT 2132, ICARD(10),
1 ICARD(11),
2 ICARD(12)
 PRINT 2133
 PRINT 2134, TG9,
1 TGT9,
2 VLI
 PRINT 2135, TG10,
1 TGT17,
2 VLI
 PRINT 2136, TG(14),
1 TLT3,

```

2 TIME1
PRINT 2137, TG(18),
1 TLT10,
2 VLRI
PRINT 2138, TL(3),
1 TLT7,
2 VLRF
PRINT 2139, TL(10),
1 TLTST,
2 TIME8
PRINT 2140, TL(7),
1 TLT4,
2 MAGFLO
PRINT 2141, TLST,
1
2 MAGFLO
PRINT 2142, TL(4)
PRINT 2143, TL(1)
2102 FORMAT(1H1,21X,'MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DA
1TA PAGE1'//)
2104 FORMAT(1H,' TEST NUMBER',2X,A8,
1 3X,'CARD NUMBER',8X,I2,
2 3X,'CARD NUMBER',8X,I2)
2105 FORMAT(1H,' DATE',2X,A8,
1 3X,'WINDBOX ST.H2O',E10.4,
2 3X,'N.G. FLOW,%SCALE',E10.4)
2106 FORMAT(1H,' TIME',6X,A4,
1 3X,'BURNER DP,H2O',E10.4,
2 3X,'N.G. STATIC,R.O.',E10.4)
2107 FORMAT(1H,' PRI.AIR ST, HG',E10.4,
1 3X,'FURN. ST.H2O',E10.4,
2 3X,'SCREW SPEED,RPM',E10.4)
2108 FORMAT(1H,' PRI.AIR DP,H2O',E10.4,
1 3X,'PP EXIT ST,HG',E10.4,
2 3X,'O2 FURN.EX.%-BM',E10.4)
2109 FORMAT(1H,' SFC.AIR ST,HG',E10.4,
1 3X,'PP EXIT DP,H2O',E10.4,
2 3X,'COMB.FURN,EX.%',E10.4)
2110 FORMAT(1H,' SEC.AIR DP,H2O',E10.4,
1 3X,'FURN.EX.ST,H2O',E10.4,

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2 3X,'ELE.CHEM.MILVOLT ',E10.4 )
2111 FORMAT(1H,28X,
1 3X,'PEEPSITE DP,HG ',E10.4,
2 3X,'CELL TEMP,F ',E10.4 )
2112 FORMAT(1H,28X,
1 3X,'P.SITE ST,PSIG ',E10.4,
2 3X,'BAROMETRIC,HG ',E10.4 )
2113 FORMAT(1H,26X,
1 3X,
2 3X
2114 FORMAT(1H, ' CARD NUMBER ',8X,12,
1 3X,'CARD NUMBER ',8X,12,
2 3X,'CARD NUMBER ',8X,12 )
2115 FORMAT(1H, ' PART.NOZ.,PSIG ',E10.4,
1 3X,'TEMP.FURN.RECORDER,F',6X,
2 3X,'TEMP.CONTINUED ' )
2116 FORMAT(1H, ' PART.LOAD,PSIG ',E10.4,
1 3X,' SEC.AIR ORIF. ',E10.4,
2 3X,' PART.SCRUB.IN ',E10.4 )
2117 FORMAT(1H, ' ABS NOZ.,PSIG ',E10.4,
1 3X,' WINDBOX-TOP ',E10.4,
2 3X,' #1 ORIFICE ',E10.4 )
2118 FORMAT(1H, ' ABS LOAD,PSIG ',E10.4,
1 3X,' WINDBOX-WEST ',E10.4,
2 3X,' FBA INLET ',E10.4 )
2119 FORMAT(1H, ' ABS GRIF.INCH ',E10.4,
1 3X,' WINDBOX-BOT. ',E10.4,
2 3X,' AIR HEATER #1 ',E10.4 )
2120 FORMAT(1H, ' ABSORBER NOZ. CODE',7X,11,
1 3X,' WINDBOX-EAST ',E10.4,
2 3X,' AIR HEATER #2 ',E10.4 )
2121 FORMAT(1H, ' MANOMETER CODE ',7X,11,
1 3X,' NC.1 BANK OUT ',E10.4,
2 3X,' PRI.AIR FAN IN. ',E10.4 )
2122 FORMAT(1H,27X,
1 3X,' NO.2 BANK OUT ',E10.4,
2 3X,' PRI.AIR WGT BULB ',E10.4 )
2123 FORMAT(1H, ' CARD NUMBER ',9X,12,
1 2X,' FURN. EXIT ',E10.4,
2 3X,' SEC.AIR FAN IN. ',E10.4 )

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```

2124 FORMAT(1H , ' MODE CF OPER. ' ,10X,11,
1 2X, ' COAL-AIR ' ,E10.4,
2 3X, ' SEC.AIR WET BULB ' ,E10.4 )
2125 FORMAT(1H , ' PART.SCR.ST,HG ' ,E10.4,
1 3X,
2 3X
2126 FORMAT(1H , ' PART.SCR.DP,H20 ' ,E10.4,
1 3X, 'CARD NUMBER ' ,8X,12,
2 3X, 'CARD NUMBER ' ,8X,12 )
2127 FORMAT(1H , ' PART.CYC.DP,H20 ' ,E10.4,
1 3X, 'VENT.ABS.DP,H20 ' ,E10.4,
2 3X, 'FBA INLET ST,HG ' ,E10.4 )
2128 FORMAT(1H , ' #1 ORIF.ST,HG ' ,E10.4,
1 3X, 'ABS CYC.DP,H20 ' ,E10.4,
2 3X, 'FBA SUMP DP,H20 ' ,E10.4 )
2129 FORMAT(1H , ' #1 ORIF.DP,H20 ' ,E10.4,
1 3X,26X,
2 3X, 'FBA DP,H20 ' ,E10.4 )
2130 FORMAT(1H , 28X,
1 3X,26X,
2 3X, 'FBA DEMIST.DP,H20 ' ,E10.4 )
2131 FORMAT(1H ,
1 3X,
2 3X
2132 FORMAT(1H , ' CARD NUMBER ' ,8X,12,
1 3X, 'CARD NUMBER ' ,8X,12,
2 3X, 'CARD NUMBER ' ,8X,12 )
2133 FORMAT(1H , ' TEMP.PILOT RECORDER,F' , 5X,
1 3X, 'TEMP.THERMOMETERS,F' ,7X,
2 3X, 'MAKEUP FLOWS ' )
2134 FORMAT(1H , ' #1 ORIFICE ' ,E10.4,
1 3X, ' PART.CYC.EXIT ' ,E10.4,
2 3X, ' PART.INIT.GAL ' ,E10.4 )
2135 FORMAT(1H , ' FBA INLET ' ,E10.4,
1 3X, ' ABS CYC.EXIT ' ,E10.4,
2 3X, ' PART.FINAL,GAL ' ,E10.4 )
2136 FORMAT(1H , ' FBA EXIT ' ,E10.4,
1 3X, ' PART.CYC.SUMP ' ,E10.4,
2 3X, ' PART.TIME,MIN ' ,E10.4 )
2137 FORMAT(1H , ' P.P.EXIT ' ,E10.4,

```

```

1 3X, ' ABS CYC.SUMP ' ,E10.4,
2 3X, ' ABS H2O IN.GAL ' ,E10.4 )
2138 FORMAT(1H, ' PART.CYC.SUMP ' ,E10.4,
1 3X, ' FBA SUMP ' ,E10.4,
2 3X, ' ABS H2O FI.GAL ' ,E10.4 )
2139 FORMAT(1H, ' ABS CYC.SUMP ' ,E10.4,
1 3X, ' MGO SLAK TANK ' ,E10.4,
2 3X, ' ABS H2O TIME,MIN ' ,E10.4 )
2140 FORMAT(1H, ' FBA SUMP ' ,E10.4,
1 3X, ' MGOH2 TANK ' ,E10.4,
2 3X, ' MGO ROTO.SCALE,% ' ,E10.4 )
2141 FORMAT(1H, ' MGO SLAK TANK ' ,E10.4,
1 3X,26X,
2 3X, ' MAKEUP SETTING ' ,E10.4)
2142 FORMAT(1H, ' MGOH2 TANK ' ,E10.4,
1 3X,26X
2)
2143 FORMAT(1H, ' MAKEUP WATER ' ,E10.4,
1 3X,
2 3X
)

```

C TEMPERATURE EQUIVALENTS

```

TG(15) = TG(9)
TL(3) = TL13
TL(7) = TL17
TL(10) = TL110
IF(JJJ.EQ.0) GO TO 160
IF(JJJ.GT.3) GO TO 160
TG(9) = TGT9
TG(15) = TGT9
TG(10) = TG10

```

160 CONTINUE

C

```

Y02D = Y02D/100.0
TG(5) = (TGWBT + TGWBW + TGWBB + TGWBE)/4.0
TL(2) = TL(3)
TL(6) = TL(7)
TL(9) = TL(10)
TL(8) = TL(1)
TL(5) = TL(1)
TL4 = TL(4)

```

TG(17)= TGT17
 C FLYASH CONCENTRATION FROM PARTICULATE SCRUBBER PRODUCT
 IF(MPAF .EQ. 0.0)GO TO 990
 MASPFA = MPAF - MPFAI
 XFA(3) = MASPFA/VOLPFA
 GO TO 995
 990 XFA(3) = 0.0
 995 CONTINUE
 C PRESBLAKING CODE
 IPRES = 0
 IF(SLKPC .GT. 0.0) IPRES = 1
 C SULFATE ANALYSIS- EXPRESSED AS EQUIVALENT GRAMS SO2/100 ML
 SULFAT = VBACL* BACLE * 0.5 * 64.0 / 96.0
 C PARTICLE DENSITY OF MGO-MG(OH)2
 DMGO = (2.40 * SLKPC + 3.65 * (100.0 - SLKPC))/100.0
 C CHEMICAL ANALYSIS OF PRODUCT STREAM
 C PALMROSE ANALYSIS- FIRST CALCULATION, GRAMS/100 ML SLURRY
 IF(FREE.LT. 0.0) GO TO 1001
 COMBIN = TOTAL - FREE
 MGO = 0.0
 MUNO = 2.0 * COMBIN - TOTAL
 GO TO 1005
 1001 COMBIN = TOTAL
 MGO = -1.0 * FREE
 MUNO= TOTAL
 FREE= 0.0
 C FLYASH CONCENTRATION, GRAMS/100 ML SLURRY
 1005 IF(MPAF .EQ. 0.0) GO TO 1010
 MASFA = MPAF - MPFAI
 XFA(10)=MASFA/VOLFA * 100.0
 GO TO 1016
 1010 XFA(10)= 0.0
 C TOTAL SUSPENDED SOLIDS
 1016 IF(MTOTF .EQ. 0.0) GO TO 1030
 MASTOT = MTOTF - MTOTI
 SOLIDT = MASTOT/VOLTOT * 100.0
 C SUSPENDED MAGNESIUM SULFITE CONCENTRATION
 SOLSUL = SOLIDT -XFA(10)- MGO * 40.0/64.0
 C AVERAGE SOLID DENSITY
 DSOLID = (2.35 *XFA(10)+ DMGO * MGO * 40.0/64.0 + 1.725 * SOLSUL)

1/SOLIDT = DSOLID * SOLIDT/(DSOLID - SOLIDT/100.0)

SOLIDC = SOLIDC/SOLIDT

GO TO 1035

1030 SOLIDT = 0.0

RATST = 1.0

SOLSUL = 0.0

1035 TOTAL = TOTAL * RATST

FREE = FREE * RATST

COMBIN = COMBIN * RATST

MGO = MGO * RATST

MONO = MONO * RATST

C PALMROSE ANALYSIS - FILTERED SAMPLE

IF(TOTAL.EQ. 0.0) GO TO 1021

1015 IF(FREE.LT.0.0) GO TO 1020

COMBID = TOTALC-FREE

MGOD = 0.0

MONOD = 2.0 * COMBID - TOTAL

BISULD = TOTALD- MONOD

GO TO 1025

1020 COMBID = TOTAL

MGOD = -1.0 * FREE

MONOD = TOTAL

BISULD = 0.0

GO TO 1025

1021 MGOD = 0.0

MONOD = 0.0

MONUL = 0.0

BISULD = 0.0

GO TO 1026

C SUSPENDED MONO FROM PALMROSE ANALYSIS, GRAMS SO2/100ML SOLUTION

1025 MONDS = MONO - MONOD

C MAGNESIUM CONCENTRATION, GRAMS SO2/100ML SOLUTION

1026 MAGN = COMBIN + MGO + SULFAT

C CHEMICAL COMPOSITION, GM-MOLES/LITER

TUTMOL = TOTAL/6.4

COMFOL = COMBIN/6.4

FREPOL = FREE/6.4

MONPOL = MONO/6.4

MONDPO = MONOD/6.4


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MONSMD = MONOS/6.4
BIMOL = BISULD/6.4 / 2.0
MGOMOL = MGL/6.4
SULMOL = SULFAT/6.4
MGPOL = MAGN/6.4
C CHEMICAL COMPOSITION,GRAMS/100ML
MUNDMA = MUNDMU * 10.4
MUNSMA = MUNSMO * 21.2
BINAS = BIMOL * 18.6
MGOMAS = MGOMOL * 4.0
SULMAS = SULMOL * 12.0
C PERCENTAGE OF SULFUR CONVERTED TO SULFATE - MOLE %
IF(TOTMOL.EQ. 0.0) GO TO 1027
SULMPC = SULMOL/(SULMOL + TOTMOL) * 100.0 * RATSTS
SOLIDT = SOLIDT * RATSTS
NNN = NNN + 1
IF(NNN.GT. 1) GO TO 1028
IF(RTCTF.EQ. 0.0 .AND. TOTAL .NE. 0.0) GO TO 1029
GO TO 1028
1029 RATSTS = 1.715/(1.715 - MUNSMA/100.0)
GO TO 1035
1028 CONTINUE
1027 CONTINUE
HTF = 1.E10
C CALCULATION OF TOTAL PRESSURES
C
PSG(3) = 2.95 * PSG(3)
PSG(5) = PSG(5)/13.55
PSG(6) = PSG(6)/13.55
PSG(14) = PSG(18)
PSG(17) = PSG(18)
PSG(15) = PSG(9) - PD(9)/13.55
DO 240 I = 1,18
240 PTG(I) = PB + PSG(I)
C
C PRIMARY AIR ORIFICE FLOW CALCULATION
C AIR HUMIDITY, MOLECULAR WT., AND DENSITY
C
PVWB(1) = 10.0 * (7.4628 - 4016.0/(TWB(1) + 460.0))
AWB(1) = 0.625 * (PVWB(1)/(PTG(1) - PVWB(1)))

```

```

C      A(1) = AWB(1) - (TGI - TWB(1))/4980.0
      HOLDUP TO FEED RATIO, 1/SEC
      XMWNG(1) = (1.0 + A(1))/(0.03475 + A(1)/18.0)
      DWG(1) = XMWNG(1)*PTG(1)/21.85/(TG(1) + 460.0)
C      PRIMARY AIR FLOW
      FWGW(1) = 20.4625 * (PD(1) * DWG(1))**0.5
      FDGW(1) = FWGW(1)/(1.0 + A(1))
      FWGV(1) = FWGW(1)/DWG(1)
      PV(1) = PTG(1) * A(1) * 28.8 / ( A(1)* 28.8 + 18.0)
      IF(PV(1) .LE. 0.0) PV(1) = 0.01
      TD(1) = 4061.0/(7.4628 - ALOG10(PV(1))) - 460.0
C
C      SECONDARY AIR FLOW CALCULATION
C      AIR HUMIDITY, MOLECULAR WT., AND DENSITY
C
      PVWB(4) = 10.0 ** (7.4628 - 4016.0/(TWB(4) + 460.0))
      AWB(4) = 0.625 * (PVWB(4)/(PB - PVWB(4)))
      A(4) = AWB(4) - (TG4 - TWB(4))/4880.0
      XMWNG(4) = (1.0 + A(4))/(0.03475 + A(4)/18.0)
      DWG(4) = XMWNG(4) * PTG(4)/21.85/(TG(4) + 460.0)
C      SECONDARY AIR FLOW
      FWGW(4) = 202.0 * (PD(4) * DWG(4))**0.5
      FDGW(4) = FWGW(4)/(1.0 + A(4))
      PV(4) = PTG(4) * A(4) * 28.8 / (A(4) * 28.8 + 18.0)
      IF(PV(4) .LE. 0.0) PV(4) = 0.01
      TD(4) = 4061.0/(7.4628 - ALOG10(PV(4))) - 460.0
      A(5) = A(4)
      FWGV(4) = FWGW(4)/DWG(4)
      FWGW(5) = FWGW(4)
      DWG(5) = XMWNG(4) * PTG(5)/21.85/(TG(5) + 460.0)
      FWGV(5) = FWGW(5)/DWG(5)
C      NATURAL GAS DENSITY ASSUMING A TEMP. AT 75F
      DWG(3) = XMWNG * (PB + PSG(3)/13.55)/21.85/(535.0)
      FNGASW = 0.716 * FNGSTP/100.0 * DWG(3)**0.5
      FNGASM = FNGASW / XMWNG
C      PEEP SITE AIR FLOW, ASSUME T = 70F
      DPAIR = 28.8 * (PSPS + 14.7)/10.73/530
      FPAIR = 3.60 * (PDPS * DPAIR) ** 0.5
      FDGW(1) = FDGW(1) + FPAIR
C      ELECTROCHEMICAL OXYGEN ANALYSER

```

```

IF(VMV .EQ. 0.0) GO TO 241
YD2EC = 10.0 ** ((VMV + 71.5)/54.01)
GO TO 242
241 YD2EC = 1.E10
242 CONTINUE
C      FLOWRATE OF NITROGEN IN FLUE GAS, #/MIN
C      FLOWRATE OF OXYGEN IN COMBUSTION AIR
C      FN2 = 0.768 * ( FDGW(1) + FDGW(4) ) + FNGASM * YN2NG * 28.0
C      F02 = 0.232 * ( FDGW(1) + FDGW(4) )
C      MATREX COEFFICINTS FOR CALCULATING CO2,SU2,AND N2
C      C1 =(FN2 * XCC * 4.19 * YD2D/ O2COAL)
C      C2 =(FN2 * XSC * 2.28 * YD2D/ O2COAL)
C      C3 = 1.0 - YD2D
C      A11 = -1.57 * FN2
C      A12 = 0.0
C      A13 = F02 * XCC * 3.67/O2COAL + FNGASM * (-XCC * O2NGAS * 3.67/
1 O2COAL + CU2NG )
C      A21 = 0.0
C      A22 = -2.285 * FN2
C      A23 = F02 * XSC * 2.0/ O2COAL + FNGASM * (-XSC * O2NGAS * 2.0/
1 O2COAL + XSNG * XMWNG * 2.0 )
C      A31 = 1.0
C      A32 = 1.0
C      A33 = 1.0
C      DENOM = A11 * A22 * A33 + A12 * A23 * A31 + A13 * A21 * A32
1 -( A13 * A22 * A31 + A11 * A23 * A32 + A12 * A21 * A33 )
C      YC02D = ( C1*A22*A33 + A12*A23*C3 + A13*C2*A32 - (A13*A22*C3
1 + A12*C2*A33 + C1*A23*A32))/DENOM
C      YSU2D = ( A11*C2*A33 + C1*A23*A31 + A13*A21*C3 - (A13*C2*A31
1 + C1*A21*A33 + A11*A23*C3))/DENOM
C      YN2D = ( A11*A22*C3 + A12*C2*A31 + C1*A21*A32 - (C1*A22*A31
1 + A12*A21*C3 + A11*C2*A32))/DENOM
C      XMWDG = YC02D * 44.0 + YD2D * 32.0 + YN2D * 28.0 + YSU2D * 64.0
C      FDGW(6) = XMWDG * FN2/YN2D/28.0
C      FCOAL = F02/O2COAL - FN2 * YD2D * 1.141/O2COAL/YN2D - FNGASM*

```

```

1  O2NGAS/O2CCOAL
  SO2CAL= 100000.0 * YSO2D
  A(6) = FCOAL/FDGGW(6) * (XWC + 9.0 * XHC) + FNGASM/FDGGW(6) * H2UNG
  1 + ( FDGGW(1) * A(1) + FDGGW(4) * A(4) )/FDGGW(6)
  EXAIR = YSO2D/0.21 * 100.0
  XMWDG(6) = (1.0 + A(6))/(1.0/XMWDG + A(6)/18.0)
  DWG(6) = XMWDG(6) * PTG(6)/21.85/(TG(6) + 460.0)
  FWGW(6) = FDGGW(6) * (1.0 + A(6))
  FWGV(6) = FWGW(6)/DWG(6)
  FWGW(7) = FWGW(6)

```

```

C
C
C
  HEAT OF FORMATION OF COMBUST AIR , BTU/# DRY AIR AT AIR TEMP.
  DO 250 I = 1,5,4
250 HFG(I) = -5779.8 * A(I) + (0.2345 + C.398 * A(I)) * (TG(I) - 32.0)
  1 + (1.765 + 7.11 * A(I)) * ((TG(I) + 460.0)**2 - (492.0)**2) * 0.00001
  2 + ( 290.0 - 445.0 * A(I)) * (1.0/(TG(I) + 460.0) - 1.0/492.0)

```

```

C
C
C
  TOTAL HEAT OF FORMATION OF FURNACE INPUT STREAMS, BTU/MINUTE
  HFTOT1 = FCOAL*(1.0 - XWC) * HFCOAL + FNGASW * HFNGAS
  1 + FDGGW(1) * HFG(1) + HFG(5) * FDGGW(4)
C
C
  HEAT OF FORMATION OF FUEL,BTU/# FUEL
  HFFUEL = (FCOAL * (1.0 - XWC) * HFCOAL + FNGASW * HFNGAS)/(FCOAL +
  1 FNGASW)

```

```

C
C
  FRACTION OF HEAT FROM COAL
  HRELC = HVALC * FCOAL* ( 1.0 - XWC)
  HRELNG = HVALNG * FNGASW
  HRELF = HRELC + HRELNG
  COALF = 100.0 * HRELC/HRELF

```

```

C
C
C
  FRACTION OF HEAT FROM NATURAL GAS
  XNGASF = 100.0 - COALF

```

```

C
C
  COMPUTER INPUT FOR CHEMICAL EQUILIBRIUM PROGRAM

```

```

C      FFEED = FCOAL + FNGASW + F02 + FN2
C      FFEED = FFEED / 60.0
C      CARBON INPUT, # ATOMS/ 100 # FEED
C      CARBIN = (FCOAL * XCC/12.0 + FNGASM * CC2NG/44.0)/FFEED * 100.
C
C      HYDROGEN INPUT, #ATOMS/ 100 # FEED
C      HYDRIN = ( FCOAL * ( XHC + XWC * 2.0/18.0 ) + FNGASM * H2ONG *
1 2.0/18.0 + (FDGW(1) +FDGW(4)) * A(1) * 2.0/18.0 )/FFEED * 100.
C
C      SULFUR INPUT, #ATOMS/ 100 # FEED
C      SULFIN =( FCOAL * XSC/32.0 + FNGASW * XSNG/32.0)/FFEED * 100.
C
C      OXYGEN INPUT, # ATOMS/ 100 # FEED
C      OXYIN = (FCOAL * (XCC/16.0 + XWC/18.0) + FNGASM * YCO2NG * 2.0/
1 44.0 + F02/16.0)/FFEED * 100.
C
C      NITROGEN INPUT, # ATOMS/ 100 # FEED
C      NITRIN = ( FCOAL * XNC/14.0 + FNGASM * YN2NG/14.0 + FN2/14.0)/
1 FFEED * 100.
C
C      TOTAL HEAT OF FORMATION OF INPUT STREAMS, BTU/100 # FEED
C
C      HFTIN = HFTOT1/FFEED * 100.
C      S02 INPUT
C      I1 = 6
45 READ 60, I
60 FORMAT(21X,12)
51 IF(I .EQ. 20) GO TO 50
52 IF(I .EQ. 11) GO TO 55
S02(I1)= 10.0*10
I1 = I1 + 1
GO TO 51
55 READ 52, RANGE(I), CHART(I), BLANK(I), TBART(I)
52 FORMAT(4F10.0)

```



```

TCBART(I) = 70.0
J = 1
46 IF(RANGE(I) .EQ. RRANGE(J) ) CONF(I) = CONVF(J)
J = J + 1
IF (J .LE. 7) GO TO 46
DDGBT(I) = XMWDG * PB / (1360.0 * (TCBART(I) + 460.0))
FDGGBT(I) = 6000.0 * DDGBT(I) / TBART(I)
FDGVB(I) = FDGGBT(I) / DDGBT(I)
FCORBT(I) = 0.2982 / FDGGBT(I)
S02(I) = (CHART(I) - BLANK(I)) * FCORBT(I) * CELLC * CONF(I)
II = II + 1
GO TO 45
50 DO 53 I = II, 20
53 S02(I) = 1.E10
C S03 INPUT
JJ = 6
65 READ 70, J
70 FORMAT(21X, I2)
75 IF(J .EQ. 20) GO TO 90
IF(J .EQ. JJ) GO TO 80
S03(JJ) = 1.E10
JJ = JJ + 1
GO TO 75
80 READ 85, PSS03(J), TS03(J), VS03(J), METCOR(J), MS03(J)
85 FORMAT(5F10.0)
DDGS03(J) = (PB + PSS03(J)) / 21.85 / (TS03(J) + 460.0)
GS03(J) = VS03(J) * DDGS03(J) * 454.0 / METCOR(J) * 1000.0
S03(J) = MS03(J) * 1000000.0 / 80.0 / GS03(J)
JJ = JJ + 1
GO TO 65
90 DO 91 J = JJ, 20
91 S03(J) = 1.E10
C NDX INPUT
II = 6
95 READ 100, I
100 FORMAT(21X, I2)
105 IF(I .EQ. 20) GO TO 120
IF(I .EQ. II) GO TO 110
NDX(II) = 1.E10
II = II + 1

```

```

GO TO 105
110 READ 115, VFLASK(I), TEVAC(I), PSEVAC(I), PSANAL(I), PBA(I),
1 TANAL(I), NO2MA(I)
115 FORMAT(7F10.0)
PVEVAC(I) = 10.0 ** ( 7.4628 - 4016.0/(TEVAC(I) + 460.0) )
PVANAL(I) = 10.0 ** ( 7.4628 - 4016.0/(TANAL(I) + 460.0) )
GMASSI(I) = VFLASK(I) * (PB + PSEVAC(I) - PVEVAC(I))/(TEVAC(I) +
1 460.0)/1360.0
GMASSF(I) = VFLASK(I) * (PBA(I) + PSANAL(I) - PVANAL(I))/(TANAL(I)
1) + 460.0)/1360.0
GMASSS(I) = GMASSF(I) - GMASSI(I)
NO2MO(I) = NO2MA(I) * 1000./46.0
NOX(I) = NO2MO(I)/GMASSS(I)
II = II + 1
GO TO 95
120 DO 121 I = 11,20
121 NOX(I) = 1.E10
C DUST LOADING
JJ = 6
125 READ 130,J
130 FORMAT(11X,12)
135 IF(J.EQ.20) GO TO 150
IF(J.EQ.JJ) GO TO 140
DL(JJ) = 1.E10
JJ = JJ + 1
GO TO 135
140 READ 145, FILTI(J), VOLM(J), PSGM(J), TGM(J), CORR(J)
145 FORMAT(6F8.0)
VOLMS(J) = VOLM(J) * (PB + PSGM(J)) * 492.0/29.92/(TGM(J) + 460.0)
1/CORR(J)
DL(J) = (FILTI(J) - FILTI(JJ)) * 15.432/VOLMS(J)
JJ = JJ + 1
GO TO 125
150 DO 151 J = JJ, 20
151 DL(J) = 1.E10
C CALCULATION OF DUST LOADING LEAVING THE FURNACE, GRAINS/DSCF
C
C METHOD 1, FURNACE MATERIAL BALANCE
C
DLICAL = FCOAL * XAC * XMWDG/FDGW(6)/359.0 * 7000.

```

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C METHOD 2, THORSTON FLY ASH SAMPLER
C NECESSARY INPUT. INITIAL BAG WT.= THORBT, FINALBAG WT.= THORBE,
C ORIFICE DIFF.= PDTHO, ORIFICE STAT.= PSTHU, ORIFICE TEMP.= TGTHO,
C SAMPLING TIME = TIMET
C
C IF(PDTHO.EQ. 0.0) GO TO 191
C DWGTHO = XMWDG(6) * (PB + PSTHU)/21.95/(460.0 + TGTHO)
C FDGWH = 1.43 * (PDTHO * DWGTHO) * 0.5 / (1.0 + A(6))
C DLTHO = (THORBE - THORBT) * 15.432 * XMWDG/FDGWH/359.0/TIMET
C DL(6) = DLTHO
C
C 191 CONTINUE
C
C PV(6) = PTG(6) * A(6) * XMWDG/(A(6) * XMWDG + 18.0)
C TD(6) = 4061.0/(7.4628 - ALUG10(PV(6))) - 460.0
C TD(7) = TD(6)
C A(7) = A(6)
C MATERIAL BALANCES - FURNACE,
C SULFUR
C FURSI = FCUAL * XSC * 60.0
C FURSE = SD2(6) * FDCW(6) * 0.000001 * 32.0/XMWDG * 60.0
C FLYASH
C FURFAI = FCUAL * XAC * 60.0
C FURFAE = DL(6) * 359. / XMWDG/7000.0 * FDGW(6) * 60.0
C WATER
C FURWI = (FCUAL * (XWC + XHC * 9.0) + FDGW(1) * A(1) + FDGW(4) * A(4)) * 60.
C FURWE = FDGW(6) * A(6) * 60.0
C DRY GAS
C FURDGI = (FDGW(1) + FDGW(4) + FCUAL * (XCC + XDC - 8.0 * XHC)) * 60.0
C FURDGE = FDGW(6) * 60.0
C
C PROGRAM SECTION CTRL
C IF(JJJ.EQ. 0) GO TO 260
C IF(JJJ.EQ. 4) GO TO 260
C IF(JJJ.EQ. 5) GO TO 260
C
C PARTICULATE VENTURI DATA
C MAKEUP WATER FLOWRATE
C
C VLI = VLI1 - VLI11

```

IF(VLI.EQ.0.0) GO TO 193

FLV(1) = VLI/TIME1

FLW(1) = FLV(1) * 8.34

PRODUCT RATE

FLV(3) = COEF(111)* PSL(3)** 0.5

FLW(3) = FLV(3) * 8.34

GO TO 192

193 FLV(1) = 0.0

FLW(1) = 0.0

FLV(3) = 0.0

FLW(3) = 0.0

192 CONTINUE

RECIRCULATION RATE

FLV(2) = 3.78 * (PSL(2) - 2.5)**0.5

FLW(2) = FLV(2) * 8.34

EXPECTED GAS FLOW RATE AND COMPOSITION

HEAT LOSE TO LIQUID

HL13 = FLW(3)* TL(3) - FLW(1)* TL(1)

EFFECTIVE ENTHALPY OF PARTICULATE VENTURI INLET GAS

HG(7) = (0.24 + 0.45 * A(6)) * TG(7) + 1061.4 * A(6) - HL13/FDGH(6)

ADIABATIC SATURATION CALCULATION

TGS(9) = 170.0

PV(9) = 10.0 ** (7.4628 - 4016.0/(TGS(9) + 460.0))

AS(9) = (18.0/XMWDG) * (PV(9)/(PTG(9) - PV(9)))

HG(9) = (0.24 + 0.45* AS(9)) * TGS(9) + 1061.4 * AS(9)

IF(ABS(HG(9) - HG(7)) .LT. 1.0) GO TO 200

SLOPE = 0.24 + 0.45 * AS(9) + (0.45 * TGS(9) + 1061.4)* 2.3 *AS(9)

1 * (1.0 + AS(9) * XMWDG/18.0) * (4016.0/(TGS(9)+460.0) ** 2)

TGS(9) = (HG(7) - HG(9))/SLOPE + TGS(9)

```

GO TO 195
200 CONTINUE
C A(9)= AS(9) - (TG(9) - TGS(9))/4880.0
C
C PARTICULATE CYCLONE EXIT GRIFICE FLOW CALCULATION
C
XMWG(9) = (1.0 + A(9))/(1.0/XMWDG + A(9)/18.0)
DWG(9) = XMWG(9)* PTG(9)/21.85/(TG(9) + 460.0)
FWGW(9) = 182.0 * (PD(9) * DWG(9))** 0.5
FDGW(9) = FWGW(9)/(1.0 + A(9))
FWGV(9) = FWGW(9)/DWG(9)
PV(9) = PTG(9) * A(9)* XMWDG/(A(9) * XMWDG + 18.0)
TD(9) = 4061.0/(7.4628 - ALUG10(PV(9))) - 460.0

```

```

C
C PARTICULATE SCRUBBER FLOW PARAMETERS
C
LGVP = FLV(2)/FWGV(9)*1000.0
LGWP = FLW(2)/FWGW(9)
VELGP = FWGV(9)/9.92

```

```

C
C GAS AND PARTICULATE REMOVAL ACROSS PARTICULATE SCRUBBER
C

```

```

IF(SC2(6) .GT. 1.E 9) GO TO 205
EFS02P = 100.0 * (1.0 - S02(9)/S02(6))
GO TO 206

```

```

205 EFS02P = 1.E10
206 CONTINUE
IF(SC3(6) .GT. 1.E 9) GO TO 207
EFS03P = 100.0 * (1.0 - S03(9)/S03(6))
GO TO 208

```

```

207 EFS03P = 1.E10
208 CONTINUE
IF(NOX(6) .GT. 1.E 9) GO TO 209
EFNOXP = 100.0 * (1.0 - NOX(9)/NOX(6))
GO TO 210

```

```

209 EFNOXP = 1.E10
210 CONTINUE
IF(DL(6) .GT. 1.E 9) GO TO 211
EFFAP = 100.0 * (1.0 - DL(9)/DL(6))
GO TO 212

```

```

211 EFFAP = 1.E10

```



```

212 CONTINUE
C MATERIAL BALANCES - PARTICULATE SCRUBBER
C SULFUR
  PARSI = FURSE
  PARSE = S02(9) * FDCW(9) * 0.000001 * 32.0/XMWDG * 60.0
C FLYASH
  PARFAI = FURFAE
  PARFAE = DL(9) * 3.08/XMWDG * FDGW(9) + FLW(3) * 60.0 * XFA(3)
  IF(XFA(3) .EQ. 0.0) PARFAE = 1.E4
C WATER
  PARWI = FDGW(6)*A(6) * 60.0 + FLW(1) * 60.0
  PARWE = FDGW(9)*A(9) * 60.0 + FLW(3)*(1.0 - XFA(3)/100.0) * 60.0
C DRYGAS
  PARDEI = FDGW(6) * 60.0
  PARDEE = FDGW(9) * 60.0
C
C PROGRAM SECTION CONTROL
C IF(JJJ .GT. 1) GO TO 275
  A(18) = A(9)
  TD(18) = TD(9)
  XMWNG(18) = (1.0 + A(18))/(1.0/XMWDG + A(18)/18.0)
  DWG(18) = XMWNG(18) * PTG(18)/21.85/(TG(18) + 460.0)
  FWGW(18) = 182.0 * (PD(18) * DWG(18))**0.5
  FWGV(18) = FWGW(18) / (1.0 + A(18))
  XMGC(4) = 1.E10
  XMGOH(4) = 1.E10
  GO TO 275
260 A(9) = A(6)
C
C PARTICULATE CYCLONE EXIT ORIFICE FLOW CALCULATION
C
  XMWNG(9) = (1.0 + A(9))/(1.0/XMWDG + A(9)/18.0)
  DWG(9) = XMWNG(9) * PTG(9)/21.85/(TG(9) + 460.0)
  FWGW(9) = 182.0 * (PD(9) * DWG(9))**0.5
  FDGW(9) = FWGW(9)/(1.0 + A(9))
  FWGV(9) = FWGW(9)/DWG(9)
  PV(9) = PTG(9) * A(9) * XMWNG/(A(9) * XMWDG + 18.0)
  TD(9) = 4061.0/(7.4628 -ALOG10(PV(9))) - 460.0
  DO 266 I = 1, 3
    FLV(I) = 1.E10

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```

FLW(1) = 1.E10
TL(1) = 1.E10
XFA(1) = 1.E10
266 APH(1) = 1.E10
A(7) = 1.E10
FNGW(7) = 1.E10
LGVP = 1.E10
LGWP = 1.E10
VELGP = 1.E10
EFS02P = 1.E10
EFS03P = 1.E10
EFN0XP = 1.E10
EFFAP = 1.E10
XFA3 = 1.E10
TD(7) = 1.E10
PSG(7) = 1.E10
TG(7) = 1.E10
PDP = 1.E10
PARSI = 1.E10
PARSE = 1.E10
PARFAI = 1.E10
PARFAE = 1.E10
PAKWI = 1.E10
PARWE = 1.E10
PARDGI = 1.E10
PARDGE = 1.E10
275 CONTINUE

```

```

C
C PROGRAM SECTION CONTROL
IF(JJJ.EQ. 0) GO TO 300
IF(JJJ.EQ. 1) GO TO 300
IF(JJJ.EQ. 3) GO TO 300
IF(JJJ.EQ. 5) GO TO 300

```

```

C
C BEGIN VENTURI ABSORBER CALCULATIONS
C
C MAKEUP WATER
VL8 = VL8F - VL81
IF(VL8.EQ. 0.0) GO TO 277
FLV(9) = VL8/TIME8

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```

FLW(8) = FLV(8) * 8.34
GO TO 276
277 FLV(8)=0.0
FLW(8)=0.0
276 CONTINUE
C PRODUCT RATE
FLV(10)= COEF(11J)* PSL(10)** 0.5
FLW(10)= FLV(10)* 8.34
C MAKEUP MGC - MG(OH)2 FLOW, #/MIN
FLW(4) = 0.0740 * MAGFLO + 1.83
FLV(4) = FLW(4)/8.34
GO TO 279
278 FLV(4) = 0.0
FLW(4) = 0.0
279 CONTINUE
C RECIRCULATION RATE
ADJ = 1.0
IF(KKI .EQ. 1) ADJ = 0.394
FLW(9) = 208.0 * PDL MGO ** 0.5 * ADJ
FLV(9) = FLW(9)/8.34
IF(PSL(9) .LT. 4.0) GO TO 280
FLW9 = COEFF(KKK) * ( PSL(9) - 4.0) ** 0.5
FLV9 = FLW9/8.34
IF(FLW(9) .EQ. 0.0) FLW(9) = FLW9
IF(FLV(9) .EQ. 0.0) FLV(9) = FLV9
GO TO 281
280 FLW9 = 0.0
FLV9 = 0.0
281 CONTINUE
FWGW(15) = FWGW(9)
C HUMIDITY OF GAS AT S02 CYCLONE EXIT
C
C
HLS02V = FLW(10)* TL(10) - FLW(8)* TL(8) - FLW(4)* TL(4)
A(15) = A(9)
TD(15) = TD(9)
HG(15) = (0.24 + 0.45 * A(15)) * TG(15) + 1061.4* A(15) -HLS02V/
1 FDGW(9)
C
C ADIABATIC SATURATION CALC.

```

```

C
305 TGS(17) = 170.0
PV(17) = 10.0 * (7.4628 - 4016.0/(TGS(17) + 460.0))
AS(17) = (18.0/XMWDG) * (PV(17)/(PTG(17) - PV(17)))
HG(17) = (0.24 + 0.45 * AS(17)) * TGS(17) + 1061.4 * AS(17)
IF (ABS(HG(17) - HG(15)).LT. 1.0) GO TO 310
SLOPE = 0.24 + 0.45 * AS(17) + (0.45 * TGS(17) + 1061.4) * 2.3 *
1AS(17) * (1.0 + AS(17) * XMWDG/18.0) * (4016.0/(TGS(17)+460.0)**2)
TGS(17) = (HG(15) - HG(17))/SLOPE + TGS(17)
GO TO 305
310 CONTINUE
A(17) = AS(17) - (TG(17) - TGS(17))/4880.0
PV(17) = PTG(17) * A(17) * XMWDG/(A(17) * XMWDG + 18.0)
TD(17) = 4061.0/(7.4628 - ALDG10(PV(17))) - 460.0
A(18) = A(17)
TD(18) = TD(17)

C
C
C
EXIT ORIFICE FLOW RATE

XMWDG(18) = (1.0 + A(18))/(1.0/XMWDG + A(18)/18.0)
DWG(18) = XMWDG(18) * PTG(18)/21.85/(TG(18) + 460.0)
DWG(17) = XMWDG(18) * PTG(17)/21.85/(TG(17) + 460.0)
FWGW(18) = 182.0 * (PD(18) * DWG(18))** 0.5
FWGV(18) = FWGW(18)/DWG(18)
FDGW(18) = FWGW(18)/(1.0 + A(18))
FWGW(17) = FWGW(18)
FWGV(17) = FWGW(17)/DWG(17)

C
C
VENTURI ABSORBER FLOW PARAMETERS
LGVV = FLV(9)/FWGV(17)*1000.0
LGWV = FLW(9)/FWGW(17)
LGWVS = FLW9/FDGW(18)
VELGV = FWGV(17)/21.0
IFIJJJ.GT. 3) GO TO 301

C
C
GAS AND PARTICULATE EFFICIENCIES ACROSS VENTURI ABSORBER
IF(S02(9).GT. 1.E9) GO TO 302
EFS02V = 100.0 * (1.0 - S02(18)/S02( 9))
GO TO 303
302 EFS02V = 1.E10

```

```

303 CONTINUE
  IF(S03(9) .GT. 1.E 9) GO TO 304
  EFS03V = 100.0 * (1.0 - S03(18)/S03( 9))
  GO TO 306
304 EFS03V = 1.E10
306 CONTINUE
  IF(NOX(9) .GT. 1.E 9) GO TO 307
  EFNOXV = 100.0 * (1.0 - NOX(18)/NOX( 9))
  GO TO 308
307 EFNOXV = 1.E10
308 CONTINUE
  IF(DL(9) .GT. 1.E 9) GO TO 309
  EFFAV = 100.0 * (1.0 - DL(18)/DL( 9))
  GO TO 321
309 EFFAV = 1.E10
  GO TO 321
301 IF(S02(6) .GT. 1.E 9) GO TO 312
  EFS02V = 100.0 * (1.0 - S02(18)/S02(6))
  GO TO 313
312 EFS02V = 1.E10
313 CONTINUE
  IF(S03(6) .GT. 1.E 9) GO TO 314
  EFS03V = 100.0 * (1.0 - S03(18)/S03(6))
  GO TO 316
314 EFS03V = 1.E10
316 CONTINUE
  IF(NOX(6) .GT. 1.E9) GO TO 317
  EFNOXV = 100.0 * (1.0 - NOX(18)/NOX(6))
  GO TO 318
317 EFNOXV = 1.E10
318 CONTINUE
  IF(DL(6) .GT. 1.E 9) GO TO 319
  EFFAV = 100.0 * (1.0 - DL(18)/DL(6))
  GO TO 321
319 EFFAV = 1.E10
321 CONTINUE
  IF(EFS02V .GT. 1.E 5) GO TO 1080

```

C
C PERFORMANCE PARAMETERS FOR VENTURI ABSORBER
KGAVEN = -60.0 * FDGW(18) * ALOG(1.0 - EFS02V/100.0)/2.71/XMWDG


```

1080 CONTINUE
SULFIT = MNDMU * FLW(9)/998.8
SO2FLO = FDGW(18) * SO2(9) * 0.000001/XMWGDG
IF(JJJ.EQ.4) SO2FLO = FDGW(18) * SO2(6)*.000001/XMWGDG
IF(SO2FLO.EQ.0.0) GO TO 1081
STSVEN = SULFIT/SO2FLO
GO TO 1082
1081 STSVEN = 1.E10
1082 CONTINUE
IF(FLW(10).EQ.0.0) GO TO 1083
TSVEN = 196.0 * (0.1725 + HIGHT/12.0)/FLW(10)
1083 CONTINUE
C MATERIAL BALANCES- SO2 ABSORBER - VENTURI
C SULFUR
IF(JJJ.GT.3) GO TO 1040
ABSSI = PARSE
GO TO 1045
1040 ABSSI = FURSE
1045 ABSSE = SO2(18) * FDGW(18)* 0.000001 * 32.0/XMWGDG * 60.0
      + (TOTAL + SULFAT) * FLW(10)* 0.30
1 MAGNESIUM
ABSMI = FLW(4) * 60.0 * XMGU(4) * 24.0/40.0/ 100.0
ABSMI = FLW(10)* 60.0 * MGMUL/41.6
C FLYASH
IF(JJJ.GT.3) GO TO 1050
ABSFAI = DL(9) * 3.08/XMWGDG *FDGW(9)
GO TO 1055
1050 ABSFAI = FURFAE
1055 ABSFAE = DL(18) * 359.0/7000.0/XMWGDG* FDGW(18) * 60.0
      +FLW(10)*0.01* XFA(10)
1 WATER
ABSWI = FDGW(9)* A(9) * 60.0 + FLW(8)* 60.0 + FLW(4)*(1.0 -
      1 XMGO(4)/100.0) * 60.0
      1 XMGO(4)/100.0) * 60.0
ABSWI =FDGW(18)*A(18)*60.+FLW(10)*(1.0 - 0.01 * (MUNDMA +0.51*
      1MUNSMI + BIMAS + MGUMAS + SULMAS +XFA(10)))* 60.0
C DRY GAS
ABSDGI = FDGW(9)* 60.0
ABSDGE = FDGW(18)* 60.0
GO TO 320
C

```

C FORCED OVERFLOW OF NON-MEASURED VARIABLES

300 DO 315 I = 8,10

FLV(I) = 1.E10

TL(I) = 1.E10

XS03(I) = 1.E10

XMG(I) = 1.E10

XS04(I) = 1.E10

XUSOL(I) = 1.E10

SGRAV(I) = 1.E10

XFA(I) = 1.E10

315 FLW(I) = 1.E10

A(15) = 1.E10

A(17) = 1.E10

FWGW(17) = 1.E10

LGVV = 1.E10

LGVV = 1.E10

VELGV = 1.E10

EFS02V = 1.E10

EFS03V = 1.E10

FFNOXV = 1.E10

EFFAV = 1.E10

TD(15) = 1.E10

TD(17) = 1.E10

TL(4) = 1.E10

FWGW(15) = 1.E10

PSG(15) = 1.E10

PSG(17) = 1.E10

PDV = 1.E10

TG(15) = 1.E10

TG(17) = 1.E10

KGAVEN = 1.E10

STSVEN = 1.E10

TSVEN = 1.E10

FLV9 = 1.E10

FLW9 = 1.E10

320 CONTINUE

C
C PROGRAM SECTION CONTROL
IF(JJJ.EQ. 0) GO TO 350
IF(JJJ.EQ. 1) GO TO 350

```

C
C
IF(JJJ.EQ. 2) GO TO 350
IF(JJJ.EQ. 4) GO TO 350

C
C
MO MAKEUP FLOWRATE FOR FBA
FLW4 = 0.074 * MAGFLO + 1.83
FLV4 = FLW4/8.34
GO TO 324
323 FLW4 = 0.0
FLV4 = 0.0
324 CONTINUE

C
C
WATER MAKEUP FLOWRATE FOR FBA
VL5 = VL8F - VLRI
IF(VL5 .EQ. 0.0) GO TO 326
FLV(5) = VL5/TIME8
FLW(5) = FLV(5) * 8.34

C
C
FLOW THROUGH NOZZLE ASSUMING 12 FEET ELEVATION
RECYCLE FLOWRATE FOR FBA
ADJ = 1.0
IF(KKI .EQ. 1) ADJ = 0.394
FLW(6) = 208.0 * PDLMO ** 0.5 * ADJ
FLV(6) = FLW(6) / 8.34
PSL(6) = PSL(9)
IF( PSL(9) .LT. 4.0) GO TO 330
FLW6 = CUEFF(KKK) * ( PSL(6) - 4.0 ) ** 0.5
FLV6 = FLW6/8.34
IF(FLW(6) .EQ. 0.0) FLW(6) = FLW6
IF(FLV(6) .EQ. 0.0) FLV(6) = FLV6
GO TO 331
330 FLW6 = 0.0
FLV6 = 0.0
331 CONTINUE
GO TO 327
326 FLV(5) = 0.0
FLW(5) = 0.0
327 CONTINUE

C
C
PRODUCT FLOWRATE FOR FBA
FLV(7) = CUEF(IJJ)* PSL(10)** 0.5

```

```

C
C
C
FLW(7) = FLV(7) * 8.34
HUMIDITY AT FBA EXIT
HLFRA = FLW(7) * TL(7) - FLW(5) * TL(5) - FLW4 * TL4
FDGW(10) = FDGW(9)
FWGW(10) = FWGW(9)
IF(TG(10) .EQ. 0.0) TG(10) = TG10
A(10) = A(9)
TD(10) = TD(9)
HG(10) = (0.24 + 0.45 * A(10)) * TG(10) + 1061.4 * A(10) - HLFRA / FDGW(9)
TGS(14) = 190.0
360 PV(14) = 10.0 * (7.4628 - 4016.0 / (TGS(14) + 460.0))
AS(14) = (18.0 / XMWDG) * (PV(14) / (PTG(14) - PV(14)))
HG(14) = (0.24 + 0.45 * AS(14)) * TGS(14) + 1061.4 * AS(14)
IF(ABS(HG(14) - HG(10)) .LT. 1.0) GO TO 355
SLOPE = 0.24 + 0.45 * AS(14) + (0.45 * TGS(14) + 1061.4) * 2.3 * AS(14)
I * (1.0 + AS(14) * XMWDG / 18.0) * (4016.0 / (TGS(14) + 460.0) ** 2)
TGS(14) = (HG(10) - HG(14)) / SLOPE + TGS(14)
GO TO 360
355 CONTINUE
A(14) = AS(14) - (TG(14) - TGS(14)) / 4880.0
PV(14) = PTG(14) * A(14) * XMWDG / (A(14) * XMWDG + 18.0)
TD(14) = 4061.0 / (7.4628 - ALUG10(PV(14))) - 460.0
A(18) = A(14)
TD(18) = TD(14)
C
C
EXIT ORIFICE FLOWRATE
XMWDG(18) = (1.0 + A(18)) / (1.0 / XMWDG + A(18) / 18.0)
DWG(18) = XMWDG(18) * PTG(18) / 21.85 / (TG(18) + 460.0)
DVG(14) = XMWDG(18) * PTG(14) / 21.85 / (TG(14) + 460.0)
FWGW(18) = 182.0 * (PD(18) * DWG(18)) ** 0.5
FWGV(18) = FWGW(18) / DWG(18)
FDGW(18) = FWGV(18) / (1.0 + A(18))
FWGW(14) = FWGW(18)
FWGV(14) = FWGV(18) / DWG(14)
C
C
FBA FLOW PARAMETERS
LGVF = FLV(6) / FWGV(14) * 1000.0
LGWF = FLW(6) / FWGW(14)

```

LGRFS = FLW6/FDGW(18)
VELGF = FNGV(14)/128.0
IF(JJJ.GT. 3) GO TO 341

C
C

GAS AND PARTICULATE PERFORMANCE FOR FBA
IF(SO2(9) .GT. 1.E 9) GO TO 342
EFSO2F = 100.0 * (1.C - SO2(18)/SO2(9))
GO TO 343
342 EFSO2F = 1.E10
343 CONTINUE
IF(SO3(9) .GT. 1.E 9) GO TO 344
EFSO3F = 100.0 * (1.0 - SO3(18)/SO3(9))
GO TO 346
344 EFSO3F = 1.E10
346 CONTINUE
IF(NOX(9) .GT. 1.E 9) GO TO 347
EFNOXF = 100.0 * (1.0 - NOX(18)/NOX(9))
GO TO 348
347 EFNOXF = 1.E10
348 CONTINUE
IF(DL(9) .GT. 1.E 9) GO TO 349
EFFAF = 100.0 * (1.0 - DL(18)/DL(9))
GO TO 351
349 EFFAF = 1.F10
GO TO 351
341 IF(SO2(6) .GT. 1.E 9) GO TO 353
EFSO2F = 100.0 * (1.0 - SO2(18)/SO2(6))
GO TO 354
353 EFSO2F = 1.E10
354 CONTINUE
IF(SO3(6) .GT. 1.E 9) GO TO 356
EFSO3F = 100.0 * (1.0 - SO3(18)/SO3(6))
GO TO 357
356 EFSO3F = 1.E10
357 CONTINUE
IF(NOX(6) .GT. 1.E 9) GO TO 358
EFNOXF = 100.0 * (1.0 - NOX(18)/NOX(6))
GO TO 359
358 EFNOXF = 1.E10
359 CONTINUE


```

IF(DL(6) .GT. 1.E 9) GO TO 361
EFFAF = 100.0 * (1.0 - DL(18)/DL(6))
GO TO 351
361 EFFAF = 1.E10
351 CONTINUE
1085 CONTINUE
IF(CFS02F .GT. 1.E 5) GO TO 1085
KGAFBA = -60.0 * FDGW(18) * ALGG(1.0 - EFS02F/100.0)/15.75/XMWDG
SULFIT = MCNDMG * FLW(6)/998.8
SU2FLO = FDGW(18) * S02( 9) * 0.000001/XMWDG
IF(JJJ .EQ. 5) SU2FLO = FDGW(18) * S02(6)*.000001/XMWDG
IF(SU2FLO .EQ. 0.0) GO TO 1086
STSFBA = SULFIT/SU2FLO
GO TO 1087
1086 STSFBA = 1.E10
1087 CONTINUE
IF(FLW(7) .EQ. 0.0) GO TO 1088
TSPBA = 297.0 * ( 0.229 + FIGHT/12.0)/FLW(7)
1088 CONTINUE
C MATERIAL BALANCES - FLOATING BED ABSORBER
C SULFUR
IF(JJJ .GT. 3) GO TO 1060
ABSSI = PARSE
GO TO 1065
1060 ABSSI = FURSE
1065 ABSE = S02(18) * FDGW(18)* 0.000001 * 32.0/XMWDG *60.0
I +(TOTAL + SULFAT) * FLW(7)* 0.30
C MAGNESIUM
ABSMI = FLW4 * 60.0 * XMGC(4)* 24.0/40.0/ 100.0
ABSMI = FLW(7) * 60.0 * MGMOL/41.6
C FLYASH
IF(JJJ .GT. 3) GO TO 1070
ABSFAT = DL(9) * 3.08/XMWDG * FDGW(9)
GO TO 1075
1070 ABSFAT = FURFAE
1075 ABSFAE = DL(18) * 359.0/7000.0/XMWDG * FDGW(18) * 60.0
I + FLW(7) * 0.01 * XFA(10)
C WATER
ABSWI = FDGW(9) * A(9) * 60.0 + FLW(5) * 60.0 + FLW4 * (1.0 -
I XMGC(4)/100.0) * 60.0

```

ABSWE = FDGW(18)* A(18) * 60.0 + FLW(7)*(1.0 - 0.01*(MUNDMA +
 1 0.51 * MONSMA + BIMAS + MGOMAS + SULMAS)) * 60.0

C DRY GAS

ABSDGI = FDGW(9) * 60.0

ABSDGE = FDGW(18)* 60.0

GO TO 370

C FORCED OVERFLOW FOR NON-MEASURED VARIABLES

350 DO 380 I = 5,7

FLV(I) = 1.E10

FLW(I) = 1.E10

TL(I) = 1.E10

XSD3(I) = 1.E10

XMG(I) = 1.E10

XSD4(I) = 1.E10

XUSUL(I) = 1.E10

XFA(I) = 1.E10

SGRAV(I) = 1.E10

A(10) = 1.E10

A(14) = 1.E10

FWGW(10) = 1.E10

FWGW(14) = 1.E10

LGVF = 1.E10

LGWF = 1.E10

VELGF = 1.E10

EFSU2F = 1.E10

EFSU3F = 1.E10

EFNUXF = 1.E10

EFFAF = 1.E10

TD(10) = 1.E10

TD(14) = 1.E10

PSG(10) = 1.E10

PSG(14) = 1.E10

TG(10) = 1.E10

TG(14) = 1.E10

FLV4 = 1.E10

FLW4 = 1.E10

TL4 = 1.E10

PDF = 1.E10

KGAFBA = 1.E10

STSFBA = 1.E10

380

```

TSFBA = 1.E10
FLV6 = 1.E10
FLW6 = 1.E10
370 CONTINUE
C PRINTOUT PREPARATION
DO 400 I = 1,18
PSG(I) = PSG(I)*13.55
FDGW(I) = FDGW(I) * 60.0
400 FDGW(I) = FDGW(I) * 60.0
FCCAL = FCCAL * 60.0
FNGASW = FNGASW * 60.0
HRELF = HRELF * 60.0
XFA(3) = XFA(3) * 100.0
YCO2D = YCO2D * 100.0
YC2D = YC2D * 100.0
IF(SULFIT.EQ. 0.0) STSVEN = 1.E10
IF(SULFIT.EQ. 0.0) STSFBA = 1.E10
IF(TOTAL.NE. 0.0) GO TO 401
TOTAL = 1.E10
TOTMOL = 1.E10
COMBIN = 1.E10
COMMOL = 1.E10
FREE = 1.E10
FREMOL = 1.E10
MOND = 1.E10
MONFOL = 1.E10
MGO = 1.E10
MGOMOL = 1.E10
MGOPAS = 1.E10
MAGN = 1.E10
MGMOL = 1.E10
ABSSE = 1.E10
401 IF(MONOD.NE. 0.0) GO TO 402
MONOD = 1.E10
MONDMO = 1.E10
MONDNA = 1.E10
MONOS = 1.E10
MONSMO = 1.E10
MONSHA = 1.E10
BISULD = 1.E10

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```

BIMUL = 1.E10
BIMAS = 1.E10
402 IF(XMGG(4) .EQ. 0.0) ABSMI = 1.E10
   IF(MGMOL .EQ. 0.0) ABSME = 1.E10
   IF(VBACL .EQ. 0.0) SULFAT = 1.E10
   IF(SULFAT .EQ. 1.E10) SULMOL = 1.E10
   IF(SULFAT .EQ. 1.E10) SULMAS = 1.E10
   IF(PTCTF .EQ. 0.0) SOLIDT = 1.E10
   IF(MFAF .EQ. 0.0) XFA(10) = 1.E10
   IF(XMGG(4) .EQ. 0.0) XMGG(4) = 1.E10
   IF(SLKPCM .EQ. 0.0) SLKPCM = 1.E10
   IF(APH(10) .EQ. 0.0) APH(10) = 1.E10
   IF(DL10 .EQ. 0.0) DL10 = 1.E10
   IF(DL7GAG .EQ. 0.0) DL7GAG = 1.E10
   IF(CONDUC .EQ. 0.0) CONDUC = 1.E10
   IF(APH(3) .EQ. 0.0) APH(3) = 1.E10
   IF(XFA(3) .EQ. 0.0) XFA(3) = 1.E10
   IF(SULMPC .EQ. 0.0) SULMPC = 1.E10
   IF(YU21 .EQ. 0.0) YU21 = 1.E10
   IF(YC2E .EQ. 0.0) YC2E = 1.E10
   IF(EFSO2V .GT. 100.0) KGAVEN = 1.E10
   IF(EFSO2F .GT. 100.0) KGAFBA = 1.E10
   IF(EFSO2V .GT. 100.0) STSVEN = 1.E10
   IF(EFSO2F .GT. 100.0) STSFBA = 1.E10
   IF(FLW(10) .EQ. 0.0) TSVEN = 1.E8
   IF(FLW(10) .EQ. 0.0) ABSME = 1.E8
   IF(FLW(7) .EQ. 0.0) TSFBA = 1.E8
   IF(FLW(7) .EQ. 0.0) ABSME = 1.E8
PRINT 500
500 FORMAT(1H1,34X,'MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DAT
1A PAGE 1')
PRINT 505, IRUN, IDATE, ITIME
505 FORMAT(1H0,4X,'RUN NUMBER',2X,A8,5X,'DATE',1X,A8,4X,'TIME OF DAY',
1 1X,A4)
PRINT 510
510 FORMAT(1H0,' FLUE GAS DATA',10X,'FLOW TEMP. NO
1X FLYASH HUM. DEW DRY STAT')
PRINT 515
515 FORMAT(1H,25X,'#/HR F PPM PPM GR/DSCF #/H
1 POINT FLOW PRES,81X,'F

```

```

PRINT 520,FWGW(1),TG(1),A(1),TD(1),FDGW(1),PSG(1)
520 FORMAT(1H,4X,PRIMARY AIR,
1F5.0,2X,F6.1,
26.0,3X,F5.1)
PRINT 525,FWGW(5),TG(5),A(4),TD(4),FDGW(4),PSG(5)
525 FORMAT(1H,4X,SECONDARY AIR,
1F5.0,2X,F6.1,
26.0,3X,F5.1)
PRINT 530,FWGW(6),TG(6),SO2(6),NOX(6),DL(6),A(6),TD(6),
1 FDGW(6), PSG(6)
530 FORMAT(1H,4X,FURNACE EXIT,
1F5.0,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,3X,F6
2.0,3X,F5.1)
PRINT 535,FWGW(7),TG(7),SO2(7),NOX(7),DL(7),A(7),TD(7),
1 PSG(7)
535 FORMAT(1H,4X,PART.SCRB.INLET,
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,4X,-
2-----,F5.1)
PRINT 540,FWGW(9),TG(9),SO2(9),SO3(9),NOX(9),DL(9),A(9),TD(9),
1 FDGW(9), PSG(9)
540 FORMAT(1H,4X,PART.CYC.EXIT,
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,3X,F6
2.0,3X,F5.1)
PRINT 545,FWGW(15),TG(15),SO2(15),SO3(15),NOX(15),DL(15),A(15),
1TD(15),PSG(15)
545 FORMAT(1H,4X,VENT ABS.INLET,
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,4X,-
2-----,F5.1)
PRINT 550,FWGW(17),TG(17),SO2(17),SO3(17),NOX(17),DL(17),A(17),
1TD(17),PSG(17)
550 FORMAT(1H,4X,ABS CYC.EXIT,
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,4X,-
2-----,F5.1)
PRINT 555,FWGW(10),TG(10),SO2(10),NOX(10),DL(10),A(10),
1TD(10),PSG(10)
555 FORMAT(1H,4X,FLOATING BED IN,
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,4X,-
2-----,F5.1)
PRINT 560,FWGW(14),TG(14),SO2(14),NOX(14),DL(14),A(14),
1TD(14),PSG(14)

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560 FORMAT(1H,4X,'FLOATING BED EX',
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,4X,'-
2-----',F5.1)
PRINT 565, FWGW(18), TG(18), SO2(18), SO3(18), NOX(18), DL(18),
1A(18), TD(18), FDGW(18), PSG(18)
565 FORMAT(1H,4X,'P.P. EXIT ORIF.',
1F5.0,2X,F6.1,2X,F6.1,2X,F5.1,2X,F5.0,2X,F7.4,2X,F6.3,2X,F5.1,3X,F6
2.0,3X,F5.1)
PRINT 570
570 FORMAT(1H0,2X,'SCRUBBER STREAM DATA',44X,'VENTURI ABSORBER',6X,
1,'FBA')
PRINT 580
580 FORMAT(1H,4X,'PARTICULATE',11X,'TEMP,F FLOW,GPM',7X,'GAS ABSORB
1ER',4X,'TEMP,F FLOW,#/M TEMP,F FLOW,#/M')
PRINT 585, TL(1),FLV(1),TL(8),FLW(8),TL(5),FLW(5)
585 FORMAT(1H,5X,'MAKEUP WATER',9X,F5.1,5X,F5.2,10X,'MAKEUP WATER',4X
1,F5.1,3X,F5.1,5X,F5.1,3X,F5.1)
PRINT 590, TL(3),FLV(3),TL(4),FLW(4),TL4, FLW4
590 FORMAT(1H,5X,'PRODUCT LIQ.',9X,F5.1,5X,F5.2,10X,'MAKEUP MGD SL.',
12X,F5.1,3X,F5.1,5X,F5.1,3X,F5.1)
PRINT 595,TL(2),FLV(2),TL(10),FLW(10), TL(7), FLW(7)
595 FORMAT(1H,5X,'RECIRCULATED LIQ.',4X,F5.1,5X,F5.2,10X,'PRODUCT LIQ
1.',4X,F5.1,3X,F5.1,5X,F5.1,3X,F5.1)
PRINT 600, TL(9),FLW9, TL(6),FLW6
600 FORMAT(1H,51X,'REC.(SPRAY NOZ)',1X,F5.1,3X,F5.1,5X,F5.1,3X,F5.1)
PRINT 601, FLW(9), FLW(6)
601 FORMAT(1H,51X,'REC.(FLOW NOZ.)',1X,8X,F5.1,13X,F5.1)
PRINT 605
605 FORMAT(1H0,2X,'FURNACE PERFORMANCE',16X,'SCRUBBER PERFORMANCE',5X,
1,'PART. VENT ABS. FLOAT.BED')
PRINT 610, HRELF, EFS02P, EFS02V, EFS02F
610 FORMAT(1H,4X,'HEAT RELEASE,BTU/HR',3X,E9.3,5X,'SO2 ABSORB.EFF',8X
1,F6.2,6X,F6.2,8X,F6.2)
PRINT 615,COALF, EFFAP, EFFAV, EFFAF
615 FORMAT(1H,4X,'% FUEL AS COAL',10X,F5.1,5X,'FLYASH COL.EFF',8X,
1 F6.2,6X,F6.2,8X,F6.2)
PRINT 620,FCOAL, EFS03P, EFS03F
620 FORMAT(1H,4X,'COAL FLOW RATE,#/HR',6X,F6.1,5X,'SO3 ABSORB.EFF',
18X,F6.2,6X,F6.2,8X,F6.2)
PRINT 625, FNGASw, EFNOXP, EFNOXV, EFNOXF

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625 FORMAT(1H,4X,'INAT.GAS FLOW,/HR',9X,F5.1,5X,'NDX ABSORP.EFF',8X,
1 F6.2,6X,F6.2,8X,F6.2)
PRINT 630, EXAIR, VELGP, VELGV, VELGF
630 FORMAT(1H,4X,'% EXCESS AIR',12X,F5.1,5X,'GAS VELOCITY,FPS',6X,
1 F6.1,6X,F6.1,8X,F6.1)
PRINT 635,YO2D,LGVP,LGVV,LGVF
635 FORMAT(1H,4X,'OXYGEN,%DRY,MEAS.
1MCF',7X,F6.1,6X,F6.1,8X,F6.1)
PRINT 640,YCO2D,LGWP,LGVV,LGVF
640 FORMAT(1H,4X,'CO2,%DRY-CALC.
1',7X,F6.1,6X,F6.1,8X,F6.1)
PRINT 645,A(6),PDP,PDV,PDF
645 FORMAT(1H,4X,'HUMIDITY,#/# - CALC.
1.WG',7X,F6.1,6X,F6.1,8X,F6.1)
PRINT 650
650 FORMAT(1H0,'SO2 ABSORPTION PARAMETERS',45X,'SULFATE FORMATION PARA
1METERS')
PRINT 651
651 FORMAT(1H,3X,'VENTURI ABSORBER',16X,'FLOATING BED ABSORBER')
PRINT 655,SULMOL
655 FORMAT(1H,73X,'CONC.,GM-MOLE/L= ',F6.4)
PRINT 660,KGAVEN,KGAFBA,SULMPC
660 FORMAT(1H,4X,'KGA,#MOLE/HR-FT2, = ',F6.1,4X,'KGA,#MOLE/HR-FT2
1 = ',F6.1,6X,'MOL% TOTAL SULF= ',F5.2)
PRINT 665,STSVEN,STSFBA,YO2D
665 FORMAT(1H,4X,'SULFITE/SO2-MOL/MOL = ',F6.2,4X,'SULFITE/SO2-MOL/MO
1L = ',F6.2,6X,'O2 AT FURN. EX.= ',F5.2)
PRINT 670,TSVEN,TSFBA,YO2I
670 FORMAT(1H,4X,'SUMP RESID.TIME,MIN = ',F6.1,4X,'SUMP RESID.TIME,MI
1N = ',F6.1,6X,'O2 AT ABSORB.IN= ',F5.2)
PRINT 675,YO2E
675 FORMAT(1H,73X,'O2 AT ABSORB.EX= ',F5.2)
PRINT 1000
1000 FORMAT(1H,3X,'***** MEANS ITEM NOT MEASURED')
PRINT 2500
PRINT 2501,IRUN,IDATE,ITIME
PRINT 2502
PRINT 2505
PRINT 2510
PRINT 2515,FURSI,FURFAI,FURWI,FURDGI,CARBIN

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PRINT 2520, FURSE, FURFAE, FURNE, FURDGE, HYDRIN
PRINT 2525, OXYIN
PRINT 2530, NITRIN
PRINT 2535, PARSI, PARFAI, PARWI, PARDGI, SULFIN
PRINT 2540, PARSE, PARFAE, PARWE, PARDGE
PRINT 2541, FFFEEED
PRINT 2545
PRINT 2550, ABSI, ABSMI, ABSFAT, ABSWI, ABSDGI, HFTIN
PRINT 2555, ABSSE, ABSME, ABSFAE, ABSWE, ABSDGE
PRINT 2559
PRINT 2560
PRINT 2565, XMGC(4)
PRINT 2567, IPRES
PRINT 2570, TOTAL, TOTMOL, SLKPCM
PRINT 2575, COMBIN, COMMOL
PRINT 2580, FREE, FRFMOL
PRINT 2585, MONC, MGNMOL, APH(10)
PRINT 2590, MONOD, MONDMC, MONDMA, DL10
PRINT 2595, MONCS, MONSMD, MONSMA
PRINT 2600, BISULD, BIMOL, BIMAS
PRINT 2605, MGO, MGOMOL, MGOMAS
PRINT 2610, SULFAT, SULMOL, SULMAS
PRINT 2615, MAGN, MGNOL, APH(3)
PRINT 2620, XFA(10), XFA(3)
PRINT 2621, SOLIDI
PRINT 2625
PRINT 2630, XCC
PRINT 2635, XHC
PRINT 2640, XOC
PRINT 2645, XSC
PRINT 2650, XAC
PRINT 2655, YWC
PRINT 2999
2999 FORMAT(1H0,'*')
      KODE = 0
      IF(MONSMA .GT. 1.E5 .AND. SOLIDI .GT. 1.E5) KODE = 1
      IF(TOTAL .EQ. 1.E10) KODE = 2
      IF(KODE .EQ. 0) PRINT 3000
      IF(KODE .EQ. 1) PRINT 3001
3000 FORMAT(1H , '*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION')

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3001 FORMAT(1H, '#TOTAL SLURRY BASIS, MASS/VOLUME SLURRY')
2500 FORMAT(1H, 25X, 'MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT D
DATA PAGE 2')
2501 FORMAT(1H, 4X, 'RUN NUMBER', 2X, A8, 5X, 'DATE', 1X, A8, 4X, 'TIME OF DAY',
1 1X, A4)
2502 FORMAT(1H, 'MATERIAL BALANCES', 54X, 'INPUT FOR EQ. - KIN. PROG.')
2505 FORMAT(1H, 19X, 'SULFUR MAGNESIUM FLYASH WATER DRY GAS')
2510 FORMAT(1H, 2X, 'FURNACE', 62X, 'INPUT FLOWS, #ATOMS/100#FEED')
2515 FORMAT(1H, 4X, 'INPUT, #/HR', , F6.2, 4X, '-----', 4X, F6.2, 4X, F6.1,
14X, F6.0, 8X, 'CARBON', , F9.6)
2520 FORMAT(1H, 4X, 'OUTPUT, #/HR', , F6.2, 4X, '-----', 4X, F6.2, 4X, F6.1,
14X, F6.0, 8X, 'HYDROGEN', , F9.6)
2525 FORMAT(1H, 73X, 'OXYGEN', , F9.6)
2530 FORMAT(1H, 2X, 'PART. SCRUBBER', 58X, 'NITROGEN', , F9.6)
2535 FORMAT(1H, 4X, 'INPUT, #/HR', 4X, F6.2, 4X, '-----', 4X, F6.2, 4X, F6.0,
14X, F6.0, 8X, 'SULFUR', , F9.6)
2540 FORMAT(1H, 4X, 'OUTPUT, #/HR', 4X, F6.2, 4X, '-----', 4X, F6.2, 4X, F6.0,
14X, F6.0)
2541 FORMAT(1H, 72X, 'FEED RATE, #/SEC =', , F5.2)
2545 FORMAT(1H, 1X, 'SO2 ABSORBERS')
2550 FORMAT(1H, 4X, 'INPUT, #/HR', 4X, F6.2, 4X, F6.2, 4X, F6.2, 4X, F6.0, 4X, F6.
10, 7X, 'ENTHALPY, BTU/# =', , F7.0)
2555 FORMAT(1H, 4X, 'OUTPUT, #/HR', 4X, F6.2, 4X, F6.2, 4X, F6.2, 4X, F6.0, 4X, F6.
10)
2559 FORMAT(1H, '*)
2560 FORMAT(1H, '#SO2 ABSORBERS-
1KEUP MGO COMPOSITION')
2565 FORMAT(1H, 'PRODUCT COMP. 100ML LITER 100ML S
SLURRY CONC. - GM MGO/100ML = , F6.2)
2567 FORMAT(1H, 53X, 'MGO PRESLAKED, NO=0, YES=1 , 5X, 11)
2570 FORMAT(1H, 2X, 'TOTAL, , F5.2, 5X, F6.4, 6X, '-----', 6X, '% S
1LAKED TO MG(OH)2, MEAS. = , F6.2)
2575 FORMAT(1H, 2X, 'COMBINED , F5.2, 5X, F6.4, 6X, '-----')
2580 FORMAT(1H, 2X, 'FREE , F5.2, 5X, F6.4, 6X, '-----', 5X, 'PRO
1DUCT MG BASE PHYSICAL PROPERTIES')
2585 FORMAT(1H, 2X, 'MONO(TOTAL) , F5.2, 5X, F6.4, 6X, '-----', 6X, 'ACI
1D STRENGTH, PH = , 3X, F5.2)
2590 FORMAT(1H, 2X, 'MONO(DISSOLVED) , F5.2, 5X, F6.4, 6X, F6.3, 6X, 'SP.GRAV
1ITY, HYDROM. = , 3X, F7.4)
2595 FORMAT(1H, 2X, 'MONO(SOLID) , F5.2, 5X, F6.4, 6X, F6.3)

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2600 FURNAT(1H, 2X, 'BISULFITE', F5.2, 5X, F6.4, 6X, F6.3)
2605 FURNAT(1H, 2X, 'FGU', F5.2, 5X, F6.4, 6X, F6.3)
2610 FURNAT(1H, 2X, 'SULFATE', F5.2, 5X, F6.4, 6X, F6.3, 5X, 'PARTICU
      ILATE SCRUBBER PRODUCT')
2615 FURNAT(1H, 2X, 'MAGNESIUM', F5.2, 5X, F6.4, 6X, '-----', 6X, 'AC
      ID STRENGTH', PH = 'F5.2)
2620 FURNAT(1H, 2X, 'FLYASH', F5.2)
      1FLYASH CONC. GM/100ML = 'F5.2)
2621 FURNAT(1H, 2X, 'SOLIDS, MG', F5.2)
2625 FURNAT(1H, 'COAL COMPOSITION-MASS')
2630 FURNAT(1H, 'CARBON', F6.4)
2635 FURNAT(1H, 'HYDROGEN', F6.4)
2640 FURNAT(1H, 'OXY+NIT', F6.4)
2645 FURNAT(1H, 'SULFUR', F6.4)
2650 FURNAT(1H, 'ASH', F6.4)
2655 FURNAT(1H, 'WATER', F6.4)
      IF (JJJ.EQ.3 .OR. JJJ.EQ.5) GO TO 3035
      SAVE(1)=EFSQ2V
      SAVE(2)=KGAVEN
      SAVE(3)=VELGV
      SAVE(4)=LGWV
      SAVE(5)=PUV
      GO TO 3040
3035 SAVE(1)=EPSQ2F
      SAVE(2)=KGAFBA
      SAVE(3)=VELGF
      SAVE(4)=LGWF
      SAVE(5)=PDF
3040 WRITE(1) IRUN, FWGW(18), TG(18), EXAIR, SAVE, APH(10), SULIDT, SULMOL
      GO TO 1
3100 END FILE 1
      REWIND 1
3110 NXA=0
      PRINT 3120
3120 FORMAT('IRUN NO. GAS FLOW GAS TEMP FURNACE SO2 ABSP KGA FOR GAS V
      * EL L/G IN PRES DP ABSORB ABSORBER SULFATE' /
      * ,
      * SORB ACROSS SLURRY SLURRY CUNC' /
      * ,
      * PL EXIT PL EXIT AIR ACROSS ABSORB
      * , ABSORB PH SUSPENDED' /

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* , ,T36,'ABSORBER # MOLES', T84,'SOLIDS GRAM-'//
* , ,T12,'#/HR DEG F %',I45,'/HR-FT2 FT/SEC #/# IN
#NG #/100#LIQ MOLES/L'//)
3130 NXA=NXA+1
      IF (NXA.GT.38) GO TO 3110
      READ (1,END=3200) IRUN,FWGW(18),TG(18),EXAIR,SAVE,APH(10),SOLIDT,
*      SULMOL
      PRINT 3140,IRUN,FWGW(18),TG(18),EXAIR,SAVE,APH(10),SOLIDT,SULMOL
3140 FORMAT(' ',A8,2X,F5.0,3X,F6.1,2X,F6.1,3X,F6.2,3X,F6.1,2X,F6.1,1X,
*      F6.1,2X,F6.1,2X,F5.2,4X,F6.3,2X,F7.4)
      GO TO 3130
3200 STOP
      END
END OF DATA FOR SDS OR MEMBER

```

III. DESCRIPTION OF COMPUTER PRINTOUT DATA

Three pages of computer printout are produced for each test. The first page is a printout of some of the input data, i.e. the first 12 cards out of approximately 30. All the input sheets are summarized in Section IV. The second and third pages denoted output page 1 and output page 2 respectively including all of the calculated results. This output data is described as follows:

FLUE GAS DATA

- FLOW
LB/HR - Determined by standard ASME sharp-edged orifices at PRIMARY AIR, SECONDARY AIR, PART. CYC. EXIT, and P.P. EXIT ORIF. The flow rate is calculated as follows:

$$FWGW = \frac{C D_o^2}{\sqrt{1-\beta^4}} \sqrt{\rho_g \Delta f}$$

where FWGW = mass flow rate of gas, lb/hr

C = orifice coefficient (C = 0.61 for all cases)

D_o = orifice diameter, inches

ρ_g = gas density, lb wet gas/ft³

Δf = orifice differential, inches w.g.

β = D_o/D_p where D_p = pipe diameter

The flue gas flow rates for all other points are determined by material balances.

- TEMP.
F - All these temperatures are determined by thermocouples or mercury thermometers.

- SO₂
PPM - All points determined by the Barton Titrator as described in Appendix A.1. The data is reported as parts per million by volume based on flue gas saturated with water vapor at 70°F.

- SO₃
PPM - Data reported as parts per million by volume dry gas by the procedure indicated in Table 4.14 and described in Appendix A.2.
- NO_x
PPM - Data reported as parts per million by volume dry gas using the PDS method. The data is not adjusted to any specific excess air.
- FLY ASH - Dust loadings at the FURNACE EXIT were determined by the Thorston
GR/DSCF sampler (see Section 3.7). Data at the PART. CYC. EXIT and P.P. EXIT ORIFICE were determined with the mini sampler. All data is reported as grains per dry standard cubic feet where standard refers to 32°F and 1 atm.
- HUM.
LB/LB - The air humidity at the PRIMARY AIR and SECONDARY AIR are determined by a sling psychrometer. Humidity at the FURNACE EXIT, PART. SCRB. INLET, VENT. ABS. INLET, and FLOATING BED IN are determined by material balance. The humidity at the PART. CYC. EXIT and P.P. EXIT ORIF. are calculated as follows:

$$A = AS - (T - TS)/4880.0$$

where A = flue gas humidity, lb/lb
 AS = saturated flue gas humidity, lb/lb
 T = gas temperature, °F
 TS = saturated gas humidity

In this calculation, TS is assumed to be the adiabatic saturation temperature and AS is the corresponding humidity.

- DEW
POINT
F - The dew point temperature is calculated directly from the gas humidity assuming ideal gas behavior.

DRY FLOW LB/HR - The dry gas flow rate is calculated from the wet gas flow rate, column one, and the gas humidity as follows:

$$FDGW = FWGW / (1 + A)$$

where FDGW = flow rate of dry gas by weight, lb/hr

FWGW = flow rate of wet gas by weight, lb/hr

A = gas humidity

The reason for calculating this term is to enable normalized comparison of flows from point to point in the pilot plant.

STAT. - All points are direct measurements by manometers.
PRES.
IN. H₂O

SCRUBBER STREAM DATA

PARTICULATE

TEMP. F - All temperatures reported here were measured via mercury thermometers.

FLOW, GPM - MAKEUP WATER - Measured by displacement meter
PRODUCT LIQ. - Measured by calibrated nozzle illustrated in Figure 2.19
RECIRCULATED LIQ. - Measured by the spray nozzle pressure

VENTURI ABSORBER or FBA

TEMP, F - All temperatures measured via mercury thermometers.

FLOW, GPM - MAKEUP WATER - Measured by displacement meter
MAKEUP MGO SL. - Measured by a rotometer
PRODUCT LIQ. - Measured by a calibrated nozzle illustrated in Figure 2.19
REC. (SPRAY NOZ) - Measured by spray nozzle pressure
REC. (FLOW NOZ) - Determined from flow nozzle differential

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR - This is based upon the heating value of the coal and natural gas.

% FUEL AS COAL - This is reported on a thermal basis.

COAL FLOW RATE, LB/HR - This is calculated and not measured. It is based upon a material balance in which the combustion air entering and excess air leaving the furnace are related to the combustion rate.

NATURAL GAS FLOW, LB/HR - The natural gas flow is monitored by a rotometer.

% EXCESS AIR - Calculated from the measured oxygen concentration.

OXYGEN, % DRY-MEAS. - Measured by a Bailey Meter Oxygen Analyzer.

CO₂, % DRY-CALC. - The CO₂ is calculated by the material balance assuming all of the carbon in the fuel goes to CO₂.

HUMIDITY, LB/LB-CALC. - Calculated by the material balance assuming that all the hydrogen in the coal reacts to form water. The humidity is expressed as pounds of water vapor per pounds of dry gas.

SCRUBBER PERFORMANCE, PART. VENT. ABS. FLOAT. BED

SO₂ ABSORB. EFF. } If the particulate venturi is in operation, the collection
FLY ASH COL. EFF. } and absorption efficiency are based upon particulate
SO₃ ABSORB. EFF. } scrubber exit and pilot plant exit measurements. If the
NO_x ABSORB. EFF. } particulate scrubber is not in operation, the collection
and absorption calculations are based upon furnace exit and pilot plant exit
measurements. Both dust collection and gas absorption efficiencies are calculated on a moisture-free basis.

GAS VELOCITY, FPS - In the case of the two venturis, this refers to the superficial velocity in the venturi throat. The gas velocity in the floating bed absorber is based upon the unobstructed flow area.

LIQ./GAS., GAL/MCF - This is the ratio of volume flow of liquid to gas expressed in units commonly used in commercial practice. The liquid flow which enters into this calculation is that measured by the flow nozzle. The gas flow is based upon gas conditions at the pilot plant exit. The units are gallons per thousand cubic feet of flue gas.

LIQ./GAS, LB/LB - The same as Item 2 except that this is a mass ratio which is more commonly used in theoretical analysis than GAL/MCF.

PRES. DROP, IN. WG. - This is the pressure drop across the scrubber only. It does not include the pressure drop across the liquid-gas separator. The pressure drop is expressed as inches of water.

SO₂ ABSORPTION PARAMETERS

VENTURI

KGA, # MOLE/HR-FT² - The derivation of the mass transfer coefficient is given in Section 5.3.2 and yields the following:

$$KGA = - \frac{60.0}{2.71} \frac{FDGW}{XMWDG} \ln(1 - E)$$

where 2.71 = volume of spray, ft³

XMWDG = molecular weight of dry gas

E = SO₂ absorption efficiency, fraction

SULFITE/SO₂ - MOL/MOL - This is the molar flow ratio of dissolved MgSO₃ passing through the absorber. If this ratio is larger than ~4 then the concentration of dissolved MgSO₃ will be relatively constant. If this ratio approaches 1, then the concentration of MgSO₃ could change significantly.

SUMP RESID. TIME, MIN. - The sump residence time is an approximate measure of the holdup time of liquid within the absorber system. It is the ratio of occupied volume to product flow. If the rate of slaking of MgO were slow, this parameter could influence the absorber's performance.

FLOATING BED

KGA, # MOLE/HR-FT² - This derivation is also given in Section 5.3.2 and yields the following:

$$KGA = - \frac{60}{15.75} \frac{FDGW}{XMWDG} \ln(1 - E)$$

where 15.75 = volume of gas-liquid contact time, ft³

SULFITE/SO₂ - MOL/MOL - Same as venturi absorber.

SUMP RESID. TIME, MIN. - Same as venturi absorber.

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L - The molar concentration of magnesium sulfate found in the product stream as determined by titrimetric methods as described in Appendix A.5.

MDL % TOTAL SULF. - This is the mole percent of all the sulfur compounds absorbed from the flue gas which shows up in the product liquid as magnesium sulfate.

O₂ AT FURN. EX. - Oxygen concentration at furnace exit as determined by a Bailey Model A57 oxygen analyzer.

O₂ AT ABSORB. IN. } These measurements were made with an Orsat analyzer
O₂ AT ABSORB. EX. } for the purpose of determining whether air had leaked into the scrubber. Such a condition could promote significant sulfate formation.

MATERIAL BALANCES

FURNACE-SULFUR - The sulfur input is based upon a calculated coal flow rate and on analyzed sulfur content. The output sulfur is based upon the measured sulfur dioxide concentration and the calculated flow rate.

Major imbalances would probably be the result of real variations in the sulfur content in the coal, incomplete coal burnout, and/or measurement errors in the SO₂ concentration.

FURNACE-FLY ASH - As with the sulfur, fly ash input is based upon the calculated coal flow rate and an analyzed ash content. The output is determined from a measured concentration and a calculated flow rate. The primary reasons for potential imbalances would be furnace slagging, dust loading measurement errors, and variations in coal composition.

FURNACE-WATER - The input water arises mostly from the coal, including both moisture and hydrogen. The moisture in the combustion air is also accounted for. The water leaving the furnace is calculated from the material balance. This balance is therefore superficial.

FURNACE-DRY GAS - The dry gas material balance is superficial since the output is calculated from the material balance.

PARTICULATE SCRUBBER-SULFUR - Both the sulfur input and output are based upon gas analysis. No allowances for sulfur leaving the particulate scrubber fly ash slurry are accounted for. Imbalances will result primarily from flue gas flow rate measurement differences across the scrubber.

PARTICULATE SCRUBBER-FLY ASH - The fly ash input into the particulate scrubber is equivalent to the furnace exit. The output is calculated from the fly ash slurry concentration and the fly ash dust loading at the furnace exit. Principal errors in the balance probably arise from the slurry concentration and flow rate measurements and slurry losses through the pump seal.

PARTICULATE SCRUBBER-WATER - This balance accounts for both the water in the flue gas and the scrubbing fluid.

PARTICULATE SCRUBBER-DRY GAS - This balance is particularly important because it compares a calculated input flow to a measured output flow. The input flow is assumed to be the same as the furnace exit flow. The exit flow is measured by an orifice.

GAS ABSORBER-SULFUR - The input sulfur is equivalent to the particulate scrubber exit sulfur. The output sulfur is measured in the exit gas SO_2 and in the product liquid as MgSO_3 , $\text{Mg}(\text{HSO}_3)$, and MgSO_4 . Principal errors will probably arise from liquid product flow measurement errors.

GAS ABSORBER-MAGNESIUM - The input magnesium is determined from the magnesium oxide makeup rate as monitored by a rotometer. The output magnesium is determined by chemical analysis of the product liquid and is equal to the molar concentration of MgSO_3 , $\text{Mg}(\text{HSO}_3)_2$, and MgSO_4 . Principal errors will arise from flow rate measurements.

GAS ABSORBER-FLY ASH - The fly ash input is determined from the particulate scrubber exit dust loading. The fly ash output is determined from the pilot plant outlet dust loading. The fly ash output is determined from the pilot plant outlet dust loading and the ash concentration in the liquid product stream.

GAS ABSORBER-WATER - The water balance is based upon the measured liquid flow rate in and out of the scrubber and the calculated humidity in the gas stream.

GAS ABSORBER-DRY GAS - Both the input and output gas flows are measured by orifices. Agreement should be good.

INPUT FOR EQ.-KIN. PROG. - The items under this heading were calculated from the assumed coal analysis and the measured coal and air flows for subsequent use in free-energy minimization and chemical kinetics programs.

These include INPUT FLOWS, # ATOMS/100# FEED, FEED RATE, #/SEC, and ENTHALPY, BTU/#

The chemical composition of the SO_2 absorbing slurry is reported on either a slurry-free basis or slurry basis as noted at the bottom of the page. The composition is given in molar form as equivalent grams SO_2 , 100 ml solution, gram moles/liter, and a mass concentration basis as grams/100 ml solution. The compositions expressed and the significance of each is as follows:

TOTAL - The total concentration of SO_2 in solution whether as $\text{SO}_3^{=}$ or HSO_3^- . Determined by iodine titration.

COMBINED - The concentration of magnesium associated with SO_2 . This does not include the magnesium associated with sulfate or oxide forms.

FREE - A measure of the acidity of the solution as determined by titration with NaOH.

MONO (TOTAL) - The total concentration of MgSO_3 in the slurry as determined by 2X Combined - Total.

MONO (DISSOLVED) - Determined by Palmrose analysis of filtered sample to remove the solids.

MONO (SOLID) - Determined by difference between mono (total) and mono (dissolved). This probably exists as $\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$ and is reported here as such.

BISULFITE - Concentration of $\text{Mg}(\text{HSO}_3)_2$ in solution. It is determined from the filtered Palmrose analysis as 2X Free.

MGO - The concentration of unreacted MgO or $\text{Mg}(\text{OH})_2$ in the system.

SULFATE - The concentration of MgSO_4 .

MAGNESIUM - The total concentration of magnesium within the product.

FLY ASH - The fly ash concentration as determined by acidifying and filtering the product slurry.

SOLIDS (MG) - The undissolved magnesium compounds principally $\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$ and MgO or $\text{Mg}(\text{OH})_2$ as determined by filtration.

MAKEUP MGO COMPOSITION

SLURRY CONC.-GM MGO/100ML - The Mgo or $\text{Mg}(\text{OH})_2$ is nearly insoluble and therefore this gives the slurry concentration being fed to the absorber.

The concentration is determined by titration with 7M sulfuric acid.
MGO PRESLAKED, NO = D, YES = 1 - Preslaking refers to a positive effort to hydrate the MgO by heating the slurry to 180°F for at least 2 hours.
% SLAKED TO $\text{Mg}(\text{OH})_2$, MEAS. - As determined by the ignition weight loss described in Appendix A.8.

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH - The pH of the product from the venturi absorber or the FBA.

SP. GRAVITY, HYDROM. - The specific gravity of the slurry from the venturi absorber of FBA.

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH - Self explanatory.

FLY ASH CONC. GM/100ML - This is the solids concentration as determined by procedure described in Section 3.12.

COAL COMPOSITION-MASS - This is the coal analysis which was assumed for the particula run in question. The probable variance in this composition is outlined in Appendix Section C.4.1.

Note that the symbol, *****, indicates that the data was not calculated or measured for the tests in question.

IV. INPUT FORMS

The specifications for each test were outlined on a specification sheet shown in Figure IV.1. The mode of operation referred to the identification of which scrubbers were to be tested.

The other items are self explanatory.

The test operational data forms are shown in Figure IV.2. These forms were used for direct computer input such that the numbers refer to the input field. These data forms include the first 13 computer input cards. The first 12 are printed out as the first page of the computer printout.

The liquid chemical analysis input form is shown in Figure IV.3. This includes all the liquid analysis data used by the computer program plus some other notes made about the magnesium oxide makeup.

The dust sampling data sheet for the Thorston Sampler is shown in Figure IV.4. The computer input is the average value of the four sets of data taken at four 10-minute intervals.

The gas sampling data sheets are all illustrated in Figure IV.5. This includes the sulfur dioxide, sulfur trioxide, nitrogen oxides (PDS method), and dust loading data. The computer program is written in such a fashion as to accept any number of sampling locations.

This includes all the recorded numerical data. In addition, a log was maintained for recording observations and subjective impressions.

FIGURE IV.1. TEST SPECIFICATION

MgO SLURRY SCRUBBING TESTS
HEW - SPONSOR

Test Specifications

Run Number _____
Mode of Operation _____
Nature of Test _____

Furnace

Secondary Air Flow _____
Secondary Air Temp. _____
O₂ Conc. at Furn. Exit _____
Operate Thorston Sampler _____

Particulate System

Recirculation Flowrate _____
Product Flowrate _____

SO₂ Scrubbers

Recirculation Flowrate _____
Product Flowrate _____
MgO Makeup Flowrate _____
Sump Level _____
MgO Slaking Time _____

Gas Sampling

	Furnace Exit	Part. Cyl. Exit	Pilot Plant Exit
SO ₂			
SO ₃			
NO _x			
Dust Load			
Particle Size			

Particulate Product

Liquid Analysis

pH _____
Fly Ash Conc. _____

SO₂ Scrubbers Product

Liquid Analysis

pH _____
Total Solids _____
Fly Ash Conc. _____
Palmarose _____
Sulfate _____

FIGURE IV.2. OPERATIONAL DATA FORM

Card Number	1	2	Card Number	1	2	Card Number	1	2	Card Number	1	2
Mode of Operation	07	4	Temperatures - Thermocoup.	10	4	Thermometers, °F	11	4	Flash Disposal	13	4
Purmax Only = 0			#1 Orifice, °F #1		8	Part. Cyc. Exit		8	Nozzle Code		4
Part. Scrub. Only = 1			FBA Inlet #2	10	16	SO ₂ Cyc. Exit	10	16	D=1, 23=2, 31=3		
+ SO ₂ Venturi = 2			FBA Exit #3	16	20	Part. Cyc. Sump	10	20	Nozzle Pressure, psia	6	20
Part. Scrub. = 3			Pilot Plant Exit #4	20	26	SO ₂ Cyc. Sump	10	26	SO ₂ Absorber Disposal		
+ FBA = 4			Part. Cyc. Sump #5	26	32	FBA Sump	20	26	Nozzle Code	14	32
SO ₂ Vent. Only = 5			SO ₂ Cyclone Sump #6	32	38	MgO Slaking Tank	20	32	D=1, 23=2, 31=3		
FBA Only = 6			FBA Sump #7	38	44	Mg(OH) ₂ Holding Tank	20	44	Nozzle Pressure, psia	14	44
Part. Vent. In. Stat. "Hg	6	12	MgO Slaking Tank #8	44	50	Card Number	1	2	Sump Height, Inches	22	50
Part. Vent. Diff. "H ₂ O	12	20	Mg(OH) ₂ Stor. Tank #9	50	56	Makeup Flow Rate	1	2	O ₂ Conc. Absorb. In. 4	32	56
Part. Cyclone Diff. "H ₂ O	20	28	Makeup Water #10	56	62	Part. Sys. - Initial, Gal	1	10	O ₂ Conc. Absorb. Exit 4	42	62
#1 Orifice Stat. "Hg	28	36				Part. Sys. - Final, Gal	1	20			
#1 Orifice Diff. "H ₂ O	36	44				Part. Sys. Time, Min	1	20			
Card Number	1	08				MgO Sys. - Initial, Gal	1	20			
SO ₂ Venturi Diff. "H ₂ O	4	10				MgO Sys. - Final, Gal	1	20			
SO ₂ Cyclone Diff. "H ₂ O	12	18				MgO Sys. Time, Min	1	20			
Card Number	1	09				Mg(OH) ₂ Rotometer Scale, 1	1	20			
FBA Inlet Stat. "Hg	4	10				Makeup Control Setting	1	20			
FBA Sump Diff. "H ₂ O	12	18									
FBA Diff. "H ₂ O	20	26									
FBA Mist Elim. Sect. "H ₂ O	28	34									

Test Number	1	8	Card Number	1	2	Card Number	1	2	Card Number	1	2
Base	10	17	Natural Gas Flow 1 Scale	03	4	Temperatures at Pri. Air Fan Inlet (Inside Building)	05	32	38		
Time	18	22	Nat. Gas Static 2.95 R.O.	12	20	Dry Bulb	4	10	60	64	
Pri. Air Static - "Hg	24	30	Feeder Speed RPM	22	30	Wet Bulb	12	18			
Pri. Air ΔP - "H ₂ O	32	40	O ₂ Analyzer	32	40	Temperatures at Sec. Air Fan Inlet (Outside Building)	20	26	68	72	
Sec. Air Static - "Hg	42	50	O ₂ Conc. at Furn. Exit 1	42	50	Dry Bulb	28	34	74	80	
Sec. Air ΔP - "H ₂ O	52	60	Comb. Conc. 1	52	60	Wet Bulb	36	42			
	62	70	Electrical Chemical Anal.	62	70		44	50			
	72	80	Millivolt Output	72	80		52	58			
Card Number	1	02	Cell Temp. °F	82	90		60	66			
Windbox Static - "H ₂ O	4	10	Barometric Press. "Hg	92	100		68	74			
Burner Draft Loss - "H ₂ O	12	20	Card Number	1	04		76	82			
Purmax Static - "H ₂ O	22	30	Part. Scrubber Pressures	4	10		84	90			
P.P. Exit Orifice Stat. "Hg	34	40	Nozzle Pressure psia	12	20		92	98			
P.P. Exit Orifice ΔP - "H ₂ O	42	50	Loading Pressure psia	22	30		100	106			
Purmax Exit Static - "H ₂ O	52	60	MgO Scrubbers	32	40		108	114			
Temp/Weight Air ΔP - "Hg	62	70	Nozzle Pressure psia	42	50		116	122			
Temp/Weight Static - psia	72	80	Loading Pressure psia	52	60		124	130			
			Orifice ΔP "Hg	62	70		132	138			
			MgO Scrubber Nozzle Code	72	80		140	146			
			47/60-1, 27/60-2, 38-3				148	154			
			H ₂ O = 0, H ₂ O = 1, H ₂ O = 4				156	162			
			Manometer Fluid				164	170			
			Mercury = 1, Red Oil = 1				172	178			

THIS DATA TAKEN DURING EVERY TEST

THIS DATA TAKEN ONLY DURING SELECTED TESTS

FIGURE IV.5. GAS SAMPLING DATA SHEETS

SO₂ DATA SHEET

Test No. _____	1 20	SO ₂ Data	1 20	SO ₂ Data
Sampling Location	22 24	Sampling Location	22 24	Sampling Location
Barton Range	1 10	Barton Range	1 10	Barton Range
Chart Reading	12 20	Chart Reading	12 20	Chart Reading
Blank Reading	22 30	Blank Reading	22 30	Blank Reading
Bubble Tube Time, Sec.	32 40	Bubble Tube Time, Sec.	32 40	Bubble Tube Time, Sec.
	42 50		42 50	
	1 20		1 20	
SO ₂ Data	22 24	SO ₂ Data	22 24	SO ₂ Data
Sampling Location	1 10	Sampling Location	1 10	Sampling Location
Barton Range	12 20	Barton Range	12 20	Barton Range
Chart Reading	22 30	Chart Reading	22 30	Chart Reading
Blank Reading	32 40	Blank Reading	32 40	Blank Reading
Bubble Tube Time, Sec.		Bubble Tube Time, Sec.		Bubble Tube Time, Sec.

THIS DATA TAKEN DURING EVERY TEST

SO₃ DATA SHEET

Test No. _____	1 20	SO ₃ Data	1 20	SO ₃ Data
Sampling Location	22 24	Sampling Location	22 24	Sampling Location
Static Pres. at Meter, "Hg	1 10	Static Pres. at Meter, "Hg	1 10	Static Pres. at Meter, "Hg
Gas Temp. at Meter, "F	12 20	Gas Temp. at Meter, "F	12 20	Gas Temp. at Meter, "F
Sampled Volume, ft ³	22 30	Sampled Volume, ft ³	22 30	Sampled Volume, ft ³
Meter Correction	32 40	Meter Correction	32 40	Meter Correction
SO ₃ Absorbed, Milligram	42 50	SO ₃ Absorbed, Milligram	42 50	SO ₃ Absorbed, Milligram
	1 20		1 20	
SO ₃ Data	22 24	SO ₃ Data	22 24	SO ₃ Data
Sampling Location	1 10	Sampling Location	1 10	Sampling Location
Static Pres. at Meter, "Hg	12 20	Static Pres. at Meter, "Hg	12 20	Static Pres. at Meter, "Hg
Gas Temp. at Meter, "F	22 30	Gas Temp. at Meter, "F	22 30	Gas Temp. at Meter, "F
Sampled Volume, ft ³	32 40	Sampled Volume, ft ³	32 40	Sampled Volume, ft ³
Meter Correction	42 50	Meter Correction	42 50	Meter Correction
SO ₃ Absorbed, Milligram		SO ₃ Absorbed, Milligram		SO ₃ Absorbed, Milligram

THIS DATA TAKEN ONLY DURING SELECTED TESTS

NO_x DATA SHEET

Test No. _____	1 20	NO _x Data	1 20	NO _x Data
Sampling Location	22 24	Sampling Location	22 24	Sampling Location
Flask Vol. (Net), ml	1 10	Flask Vol. (Net), ml	1 10	Flask Vol. (Net), ml
Room Temp. During Evac., "F	12 20	Room Temp. During Evac., "F	12 20	Room Temp. During Evac., "F
Stat. Pres. at End Evac., "Hg	22 30	Stat. Pres. at End Evac., "Hg	22 30	Stat. Pres. at End Evac., "Hg
Stat. Pres. Before Analy., "Hg	32 40	Stat. Pres. Before Analy., "Hg	32 40	Stat. Pres. Before Analy., "Hg
Bar. Pres. Before Analy., "Hg	42 50	Bar. Pres. Before Analy., "Hg	42 50	Bar. Pres. Before Analy., "Hg
Room Temp. Before Analy., "F	52 60	Room Temp. Before Analy., "F	52 60	Room Temp. Before Analy., "F
Mass NO ₂ in Solution, mg	62 70	Mass NO ₂ in Solution, mg	62 70	Mass NO ₂ in Solution, mg
	1 20		1 20	
NO _x Data	22 24	NO _x Data	22 24	NO _x Data
Sampling Location	1 10	Sampling Location	1 10	Sampling Location
Flask Vol. (Net), ml	12 20	Flask Vol. (Net), ml	12 20	Flask Vol. (Net), ml
Room Temp. During Evac., "F	22 30	Room Temp. During Evac., "F	22 30	Room Temp. During Evac., "F
Stat. Pres. at End Evac., "Hg	32 40	Stat. Pres. at End Evac., "Hg	32 40	Stat. Pres. at End Evac., "Hg
Stat. Pres. Before Analy., "Hg	42 50	Stat. Pres. Before Analy., "Hg	42 50	Stat. Pres. Before Analy., "Hg
Bar. Pres. Before Analy., "Hg	52 60	Bar. Pres. Before Analy., "Hg	52 60	Bar. Pres. Before Analy., "Hg
Room Temp. Before Analy., "F	62 70	Room Temp. Before Analy., "F	62 70	Room Temp. Before Analy., "F
Mass NO ₂ in Solution, mg		Mass NO ₂ in Solution, mg		Mass NO ₂ in Solution, mg

THIS DATA TAKEN ONLY DURING SELECTED TESTS

DUST LOADING DATA

Test Number	1 10	Third Point	1 10
First Point	Dust Load	Dust Load	Dust Load
Enter Sampling Loc.	12 13	Enter Sampling Loc.	12 13
06 - Furnace Exit		Initial Filter wt.	1 8
09 - Part. Cyt. Exit		Final Filter wt.	9 16
18 - P. F. Exit		Volume Sampled	17 24
*20 - No Dust Sampled		Meter Pressure	23 32
Initial Filter wt., grams	1 8	Meter Temp.	33 40
Final Filter wt., grams	9 16	Meter Correction Factor	42 48
Volume Sampled cu. ft.	17 24	Fourth Point	1 10
Meter Pressure, "Hg	23 32	Dust Load	12 13
Meter Temp., "F	33 40	Enter Sampling Loc.	1 8
Meter Correction Factor	42 48	Initial Filter wt.	9 16
Second Point	1 10	Final Filter wt.	17 24
Enter Sampling Loc.	12 13	Volume Sampled	23 32
Initial Filter wt., grams	1 8	Meter Pressure	33 40
Final Filter wt., grams	9 16	Meter Temp.	42 48
Volume Sampled, cu. ft.	17 24	Meter Correction Factor	42 48
Meter Pressure, "Hg	23 32		
Meter Temp., "F	33 40		
Meter Correction Factor	42 48		

THIS DATA TAKEN ONLY DURING SELECTED TESTS

V. RUN NUMBER NOMENCLATURE

<u>Test Series</u>	<u>Purpose</u>	<u>Dates</u>
A-xxx	Final Shakedown Tests	11/18/69-12/5/69
B-xxx	Parameter Study, Particulate Scrubber and Venturi Absorber, Faulty Gas Analysis	12/4/69-12/9/69
C-xxx	Parameter Study, Particulate Scrubber and Venturi Absorber	12/12/69-12/19/69
D-xxx	Parameter Study, Particulate Scrubber and Floating Bed Absorber	1/9/70-1/26/70
E-xxx	Parameter Study, Particulate Scrubber and Venturi Absorber	2/2/70-2/6/70
F-xxx	Extended Test, Particulate Scrubber and Venturi Absorber	3/9/70-3/10/70
G-xxx	Parameter Study, Particulate Scrubber and Venturi Absorber, Elevated Sulfates	3/18/70
H-xxx	Extended Test, Particulate Scrubber and Venturi Absorber	3/23/70-3/24/70
I-xxx	Extended Test, Particulate Scrubber and Venturi Absorber	3/31/70-4/2/70
J-xxx	Extended Test, Venturi Absorber Only (Particulate Scrubber Bypassed)	4/14/70-4/16/70
K-xxx	NO ₂ Injection Tests	4/9/70
L-xxx	Extended Test, Particulate Scrubber and Floating Bed Absorber	4/27/70-4/30/70
M-xxx	Extended Test, Floating Bed Absorber Only, (Particulate Scrubber Bypassed)	5/12/70-5/15/70
N-xxx	Parameter Study, Particulate Scrubber and Floating Bed Absorber, Elevated Sulfates	5/27/70
O-xxx	Parameter Study, Particulate Scrubber and Floating Bed Absorber, Elevated Sulfates	7/21/70

VI. SUMMARY TABLES

The following is a summary of some of the more important calculated and/or measured items. This is a consolidation of the data on the individual data sheets.

RUN NO.	GAS FLOW AT PILOT PL EXIT	GAS TEMP AT PILOT PL EXIT	FURNACE EXCESS AIR	SO2 ABSP EFF	SO2 ABSP ACROSS ABSORBER	KGA FOR SO2 ABSP /HR-FT2	# MOLES /HR-FT2	GAS VEL IN ABSORB	L/G IN ABSORB	PRES DP ACROSS ABSORB	ABSORB SLURRY PH	ABSORB SLURRY SUSPENDED SOLIDS #/100#LIO	SULFATE CONC GRAM- MOLES/L
C-012	5947.	123.0	12.9	64.01	66.7	77.6	5.5	1.5	5.40	3.201	0.0156		
C-013	5933.	125.0	13.3	69.44	77.0	77.5	3.5	1.5	5.20	1.475	0.0146		
C-014	5986.	127.0	13.3	88.66	143.0	78.5	3.5	1.5	6.20	19.510	0.0209		
C-015	5912.	128.0	12.9	89.50	145.5	77.6	5.3	1.4	7.00	10.289	0.0232		
C-016	6020.	127.0	12.9	78.63	101.1	79.5	5.2	1.7	6.50	2.699	0.0161		
C-017	6066.	129.0	12.4	77.60	98.5	80.5	3.3	1.5	6.50	6.943	0.0146		
C-018	6067.	129.0	12.4	79.26	103.5	80.5	3.3	1.6	7.30	10.381	0.0070		
C-019	6026.	128.0	12.4	81.42	110.5	79.5	5.0	1.6	7.60	8.437	0.0167		
C-020	5913.	116.0	12.9	78.27	100.7	74.6	5.3	1.4	6.20	4.235	0.0180		
C-021	5837.	118.0	13.3	76.07	93.2	73.5	3.8	1.4	6.40	4.350	0.0135		
C-022	5988.	121.0	11.4	77.42	99.9	76.5	3.7	1.4	7.50	1.575	0.0177		
C-023	5919.	121.0	12.4	80.31	108.0	75.8	5.2	1.5	7.40	2.634	0.0198		
C-024	5941.	120.0	11.9	79.71	106.3	75.6	5.2	1.5	7.00	0.475	0.0266		
C-025	5978.	124.0	12.4	77.71	100.5	76.6	3.7	1.3	7.10	4.377	0.0250		
C-026	5963.	123.0	12.9	77.28	98.2	77.0	3.7	1.3	8.20	8.440	0.0240		
C-027	5991.	120.0	12.4	83.45	120.4	76.9	5.2	1.5	7.50	8.845	0.0118		
D-028	6110.	123.0	11.4	*****	23.8	12.7	2.0	5.0	6.40	1.270	*****		
D-029	6280.	126.0	13.3	*****	28.4	13.4	1.5	4.8	6.00	7.194	*****		
D-030	6057.	127.0	12.4	*****	36.4	12.8	1.7	4.9	5.50	10.085	0.0206		
D-031	6368.	130.0	13.3	*****	21.5	13.2	0.3	4.2	6.20	5.479	0.0312		
D-032	6289.	132.0	12.9	*****	21.0	13.1	0.3	4.0	6.70	7.240	0.0365		
D-033	6208.	128.0	12.4	*****	23.9	13.3	1.3	4.5	5.50	6.075	0.0133		
D-034	6195.	128.0	12.9	*****	32.4	13.3	1.3	4.7	6.00	7.153	0.0216		
D-035	6190.	130.0	11.4	*****	19.4	13.3	0.3	4.2	5.90	2.463	0.0312		
D-036	6192.	130.0	13.3	*****	23.3	13.3	2.4	5.5	5.00	4.386	0.0130		
D-037	6200.	131.0	11.9	*****	33.1	13.3	2.4	5.3	5.50	8.571	0.0432		
D-038	6188.	131.0	11.9	*****	39.4	13.3	3.9	6.5	5.40	5.797	0.0224		
D-039	6197.	130.0	12.9	*****	27.6	13.3	3.9	6.4	5.30	0.062	0.0669		
D-040	6151.	132.0	13.3	*****	55.1	13.4	4.1	6.6	7.00	*****	0.0263		
D-041	6142.	132.0	12.4	*****	44.5	13.4	2.6	5.7	7.30	12.666	0.0240		
D-042	6138.	134.0	13.3	*****	55.5	13.4	4.2	6.6	7.50	14.307	0.0141		
D-043	6059.	134.0	12.9	*****	45.4	13.6	2.6	5.7	7.80	11.884	0.0284		
D-044	6080.	132.0	12.9	*****	55.5	13.3	4.3	6.6	7.20	11.586	0.0333		
D-045	6078.	133.0	11.9	*****	43.6	13.3	2.5	5.7	7.40	9.754	0.0332		
D-046	6147.	132.0	11.9	*****	55.7	13.4	4.2	6.5	7.00	14.082	0.0353		
D-047	6141.	134.0	12.4	*****	42.6	13.4	2.6	5.7	6.50	11.998	0.0357		
E-048	5664.	135.0	11.4	80.28	99.2	77.0	4.6	1.4	6.50	7.236	0.0581		
E-049	5426.	133.0	11.9	73.19	77.4	74.0	4.9	1.7	5.70	12.727	0.0258		

RUN NO.	GAS FLOW AT PILOT PL EXIT	GAS TEMP AT PILOT PL EXIT	FURNACE EXCESS AIR	SU2 ABSP EFF ACROSS ABSORBER	KGA FOR SO2 ABSP # MOLES /HR-FT2	GAS VFL IN ABSORB	L/G IN ABSORB	PRES OP ACROSS ABSORB	ABSORB SLURRY PH	ABSORB SLURRY SUSPENDED SOLIDS #/100#LIQ	SULFATE CONC GRAM- MOLES/L
	#/HR	DEG F	%			FT/SEC	#/#	IN WG			
E-050	5155.	134.0	12.4	68.88	65.2	70.5	4.9	1.7	5.20	6.022	0.0266
E-051	6192.	132.0	13.3	62.96	67.2	81.8	4.2	1.8	5.10	0.039	0.0315
E-052	6167.	135.0	12.9	75.78	95.2	82.0	2.9	1.5	8.40	15.854	0.0753
E-053	6171.	134.0	12.4	74.44	91.5	82.4	3.0	1.5	5.80	14.815	0.0719
E-054	6196.	136.0	12.4	65.83	72.0	82.0	2.8	1.4	5.40	0.049	0.0617
E-055	6195.	136.0	12.9	64.14	68.9	82.0	2.8	1.5	5.40	0.040	0.0628
E-056	6167.	141.0	10.5	60.69	62.2	82.0	2.2	0.1	7.00	10.643	0.0409
F-058	6321.	135.0	4.8	*****	*****	81.5	4.8	1.7	*****	*****	*****
F-059	6030.	136.0	4.3	*****	*****	83.9	5.0	1.6	3.90	*****	0.0288
F-060	6117.	136.0	4.8	83.98	119.0	82.8	4.3	1.5	8.60	*****	*****
F-061	6113.	136.0	4.8	78.27	98.8	82.9	4.4	1.6	*****	22.296	0.0549
F-062	6172.	137.0	3.8	80.15	105.9	83.5	4.4	1.6	*****	*****	*****
F-063	6110.	137.0	5.2	78.44	99.5	82.8	4.5	1.5	*****	*****	*****
F-064	6170.	137.0	4.8	78.16	99.7	83.7	4.3	1.5	*****	*****	*****
F-065	6111.	137.0	4.8	73.78	86.8	82.9	4.4	1.5	8.80	19.015	0.0406
F-066	6111.	137.0	5.2	81.63	109.9	82.8	4.4	1.6	8.30	*****	0.0397
F-067	6163.	138.0	4.8	66.23	70.9	83.8	4.3	1.6	7.30	*****	0.0295
F-068	6157.	138.5	4.8	68.74	75.7	83.6	4.4	1.6	7.10	*****	0.0351
F-069	6175.	137.5	4.8	78.81	102.1	83.5	4.5	1.5	8.30	12.984	0.0382
F-070	6162.	138.0	4.8	77.95	98.7	83.8	4.6	1.5	8.00	*****	0.0284
F-071	6351.	139.0	4.8	81.59	112.8	87.1	4.4	1.5	8.00	*****	*****
F-072	6125.	138.0	4.8	77.00	94.1	84.4	4.6	1.6	8.00	*****	*****
F-073	5992.	138.0	5.2	76.70	91.7	83.2	4.7	1.4	8.60	*****	*****
F-074	6042.	138.0	4.8	78.26	96.7	82.4	4.6	1.4	8.50	*****	0.0188
F-075	6253.	139.0	4.8	79.23	102.9	85.7	4.5	1.4	8.20	*****	0.0613
F-076	6019.	140.0	4.8	*****	-906.7	82.6	4.6	1.4	3.20	22.954	*****
F-077	6010.	140.0	9.5	*****	*****	82.7	0.0	1.4	9.00	*****	*****
F-078	6013.	140.0	9.5	*****	*****	82.5	4.2	1.4	*****	*****	*****
F-079	5931.	136.0	9.0	*****	*****	80.3	0.0	1.0	*****	*****	*****
G-080	6184.	125.0	14.8	58.35	63.8	77.6	4.2	1.2	5.20	16.154	0.0283
G-081	6199.	126.0	14.3	67.52	82.8	77.1	4.4	0.8	5.50	4.792	0.0537
G-082	6080.	124.0	13.3	67.52	80.6	78.9	4.4	1.4	5.50	13.224	0.03126
G-083	6078.	126.0	13.8	64.74	75.0	78.6	4.5	1.2	*****	10.973	0.0276
H-084	6010.	122.0	28.1	78.07	102.9	79.5	4.4	1.6	5.80	*****	0.049
H-085	6005.	123.0	27.6	74.91	93.6	79.5	4.4	1.6	5.80	4.411	0.0462
H-086	6043.	123.0	27.6	78.22	103.6	79.0	4.2	1.7	*****	*****	*****
H-087	6119.	124.0	28.6	79.86	110.4	81.3	4.4	1.4	*****	*****	0.0225
H-088	6002.	126.0	29.5	76.41	97.8	79.6	4.4	1.3	*****	*****	*****

RUN NO.	GAS FLOW AT PILOT PL EXIT	GAS TEMP AT PILOT PL EXIT	FURNACE EXCESS AIR	SO2 ABSP EFF ACROSS	KGA FOR SU2 ABSP	GAS VEL IN ABSORB	L/G IN ABSORB	IN PRES ACROSS ABSORB	DP ABSORB PH	ABSORB SLURRY SUSPENDED	ABSORB SLURRY SUSPENDED	SULFATE CONC
	#/HR	DEG F	%	ABSORBER # MOLES /HR-FT2	FT/SEC	#/#	IN WG			#/100#L10	GRAM- MOLES/L	
H-089	6002.	126.0	28.6	73.38	89.4	79.7	4.4	1.3	***	***	0.0305	
H-090	5997.	126.0	28.6	73.38	89.2	79.7	4.4	1.4	***	***	0.0411	
H-091	5996.	126.0	29.0	77.66	100.9	79.7	4.4	1.4	***	***	0.0353	
H-092	5987.	127.0	27.6	77.49	99.9	79.7	4.4	1.4	***	11.801	0.0314	
H-093	5983.	128.0	28.1	75.53	94.3	79.9	4.4	1.4	***	***	0.0308	
H-094	5984.	128.0	29.0	77.39	99.9	79.9	3.7	1.2	***	19.630	0.0300	
H-095	5963.	128.0	30.0	80.53	108.4	80.0	3.6	1.2	***	***	0.0308	
H-096	5974.	128.0	27.6	77.85	100.8	80.2	3.4	1.1	***	***	0.0205	
H-097	5934.	130.0	28.6	77.41	97.2	80.6	3.3	1.1	***	23.515	0.0346	
H-098	5927.	130.0	28.6	69.27	76.2	80.6	3.0	1.0	***	***	0.0423	
H-099	5968.	130.0	27.6	72.10	84.7	80.1	2.6	1.0	***	16.447	0.0356	
H-100	5972.	132.0	28.6	66.28	72.4	79.9	2.4	0.9	***	***	***	
H-101	5845.	131.0	27.6	64.88	67.7	78.5	2.2	0.8	***	***	0.0724	
I-102	5959.	131.0	28.1	80.82	107.8	80.1	4.6	1.6	***	12.962	0.0341	
I-103	5977.	130.0	28.6	80.82	108.2	80.0	4.6	1.5	***	***	0.0168	
I-104	5990.	132.0	28.6	79.23	103.4	79.7	4.5	1.8	***	9.094	0.0208	
I-105	5973.	132.0	28.1	79.23	103.0	79.8	4.6	1.8	***	***	0.0180	
I-106	5956.	132.0	30.5	79.23	102.0	80.0	4.4	1.7	***	***	0.0194	
I-107	5967.	132.0	28.1	78.94	101.5	79.9	4.4	1.7	***	7.614	0.0272	
I-108	5961.	132.0	29.5	83.47	117.1	80.0	4.4	1.8	***	***	0.0434	
I-109	5958.	134.0	29.5	82.10	112.2	80.0	4.4	1.7	***	***	0.0231	
I-110	5959.	134.0	29.0	80.22	105.7	79.9	4.4	1.7	***	11.326	0.0309	

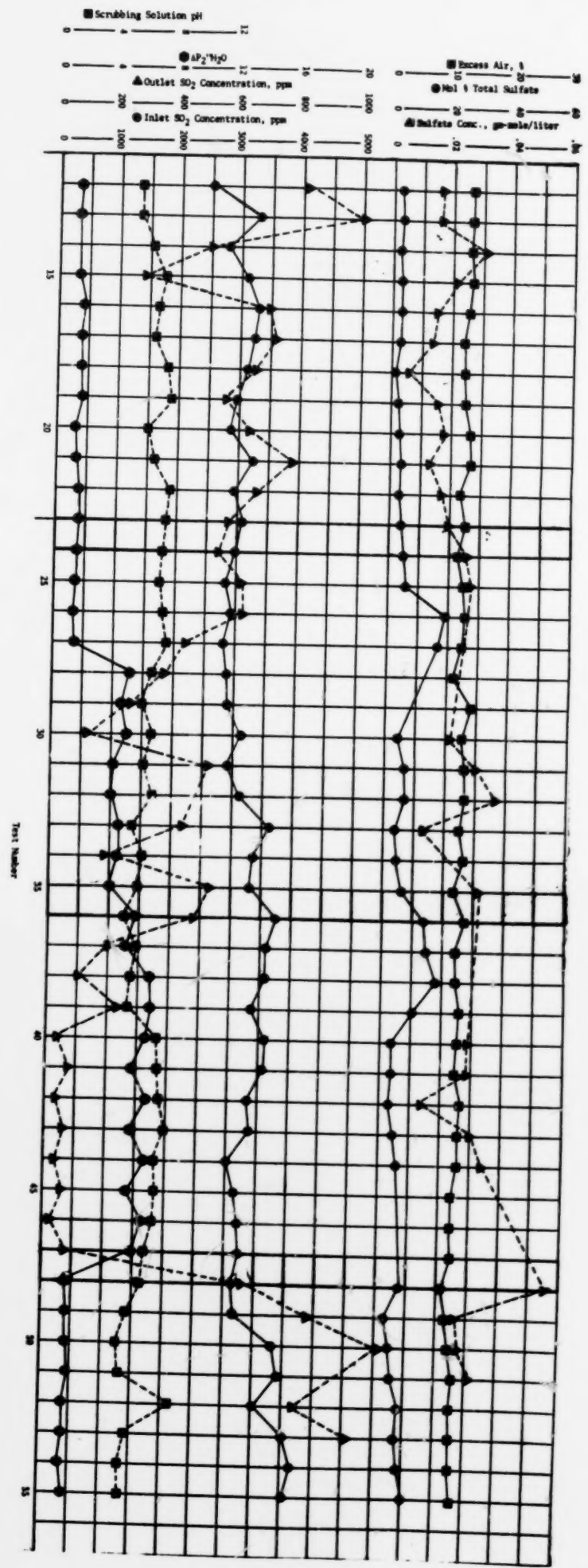
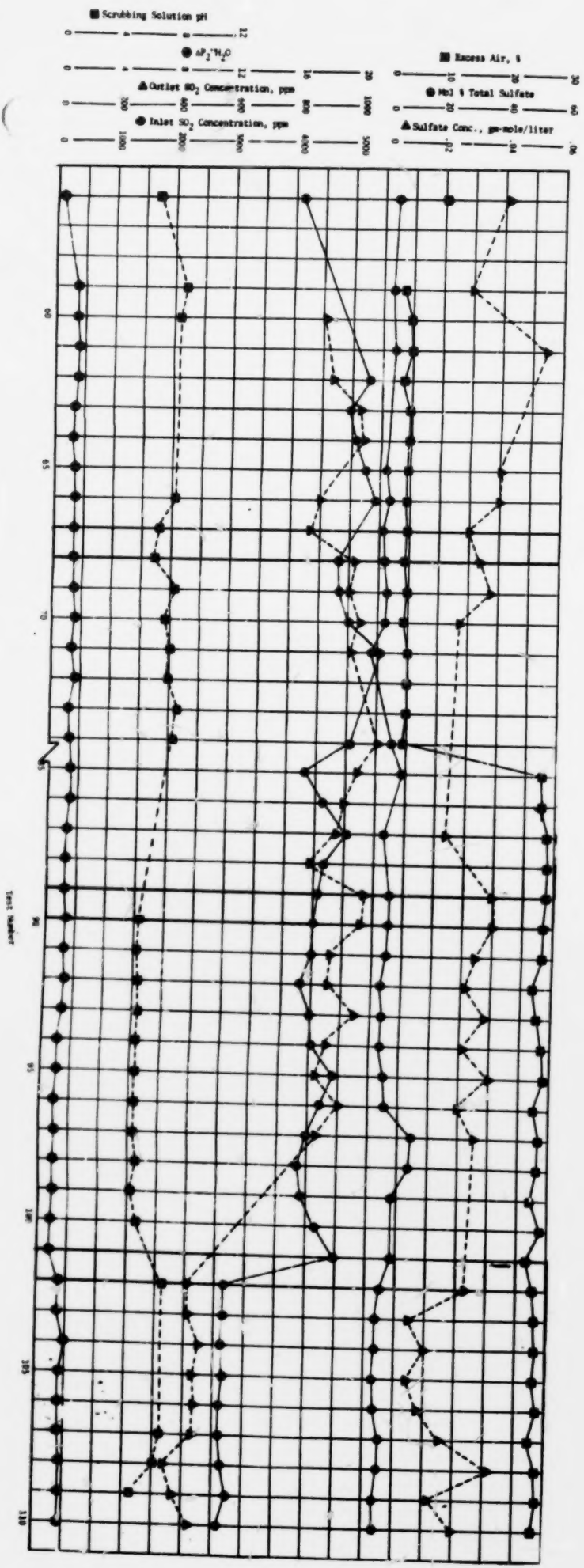
RUN NO.	GAS FLOW AT PILOT PL EXIT	GAS TEMP AT PILOT PL EXIT	FURNACE EXCESS AIR	SO2 ABSP EFF ACROSS ABSORBER	KGA FOR SO2 ABSP #/HR-FT2	GAS VEL IN ABSORB FT/SEC	L/G IN ABSORB #/#	PRES DP ACROSS ABSORB	ABSORB SLURRY PH	ABSORBER SUSPENDED SOLIDS #/100#LIQ	SULFATE CONC
	#/HR	DEG F	%		# MOLES			IN WG			GRAV- MOLES/L
I-111	5971.	133.0	29.0	80.32	106.7	79.9	4.4	1.7	8.20	****	0.0148
I-112	5953.	134.0	28.6	79.76	103.7	80.0	4.4	1.7	7.80	****	0.0138
I-113	5957.	134.0	28.6	84.25	120.0	80.0	4.4	1.7	****	14.464	0.0148
I-114	5993.	133.0	23.8	82.20	111.6	79.6	4.7	1.8	6.80	****	0.0138
I-115	6016.	136.0	23.8	83.04	114.8	79.3	4.6	1.8	****	0.000	0.0203
I-116	5980.	136.0	19.0	82.57	112.0	79.9	4.7	1.8	6.60	****	0.0171
I-117	5937.	138.0	19.0	80.90	104.9	80.1	4.5	1.6	6.70	****	0.0203
I-118	4733.	138.0	19.0	80.78	-0.0	100.6	5.5	1.6	****	****	****
I-119	5948.	137.0	18.1	81.76	108.2	80.1	4.4	1.8	6.80	****	0.0148
I-120	5950.	136.0	19.5	81.95	109.0	80.3	4.3	1.8	6.80	****	0.0135
I-121	5903.	136.0	19.0	82.88	110.9	80.8	4.7	1.8	6.60	****	0.0208
I-122	5753.	138.0	22.9	79.59	97.7	79.5	4.7	1.7	****	****	0.0180
I-123	5803.	140.0	18.6	46.63	38.9	80.4	4.8	1.7	6.60	****	0.0134
I-124	5785.	141.0	23.3	82.49	108.1	80.8	4.8	1.8	****	****	0.0383
I-125	5808.	137.0	18.6	78.59	95.5	80.4	4.8	1.7	****	****	0.0115
I-126	5782.	132.0	28.6	80.27	103.0	79.2	4.9	1.6	6.20	****	0.0217
I-127	5860.	129.0	19.0	75.14	89.0	79.8	4.7	1.6	****	****	0.0238
I-128	5735.	124.0	29.5	72.35	81.0	78.4	4.7	1.4	****	****	0.0268
J-129	5929.	134.0	26.2	****	****	80.1	5.2	7.2	****	****	0.0208
J-130	5829.	133.0	24.3	97.98	243.0	78.6	4.8	9.0	6.30	6.30	0.0360
J-131	5995.	129.0	28.6	96.47	217.3	79.5	5.2	8.4	7.90	****	0.0438
J-132	6026.	129.0	28.6	97.62	244.6	82.2	5.2	8.4	7.70	****	0.0314
J-133	5927.	142.0	19.0	96.35	215.4	77.8	5.4	2.2	7.80	****	0.0323
J-134	5741.	144.0	19.0	84.67	118.5	75.2	5.6	2.0	7.70	6.200	0.0360
J-135	5958.	142.0	20.0	87.06	130.3	80.5	5.0	2.8	7.60	****	0.0263
J-136	5899.	140.0	21.0	87.90	131.0	81.3	5.3	3.4	7.60	****	0.0415
J-137	5958.	150.0	12.9	80.79	104.4	80.3	5.4	2.7	6.80	****	0.0351
K-138	5734.	131.0	16.7	66.12	68.4	76.6	4.9	0.8	6.00	****	0.2039
K-139	6006.	134.0	14.3	79.23	104.9	79.5	4.6	1.6	9.20	****	0.1574
L-140	6041.	122.0	23.8	****	50.7	12.9	4.6	6.8	6.70	****	0.0466
L-141	6216.	122.0	24.8	****	56.7	13.0	4.6	6.2	6.80	****	0.0367
L-142	6064.	122.0	27.1	****	59.2	12.8	4.4	6.6	7.70	6.582	0.0360
L-143	4989.	124.0	26.7	****	43.6	10.6	5.5	6.2	7.40	****	0.0351
L-144	5056.	123.0	27.1	****	45.2	10.7	5.4	6.2	7.50	****	0.0461
L-145	4989.	124.0	27.6	****	49.2	10.6	5.5	6.1	7.30	****	0.0443
L-146	5051.	125.0	27.6	****	56.1	10.8	5.4	6.2	7.50	****	0.0406
L-147	4970.	125.0	27.6	****	46.9	10.6	5.5	6.2	7.50	****	0.0461
L-148	5739.	124.0	22.9	****	50.5	12.2	4.6	6.2	7.60	11.669	0.0425

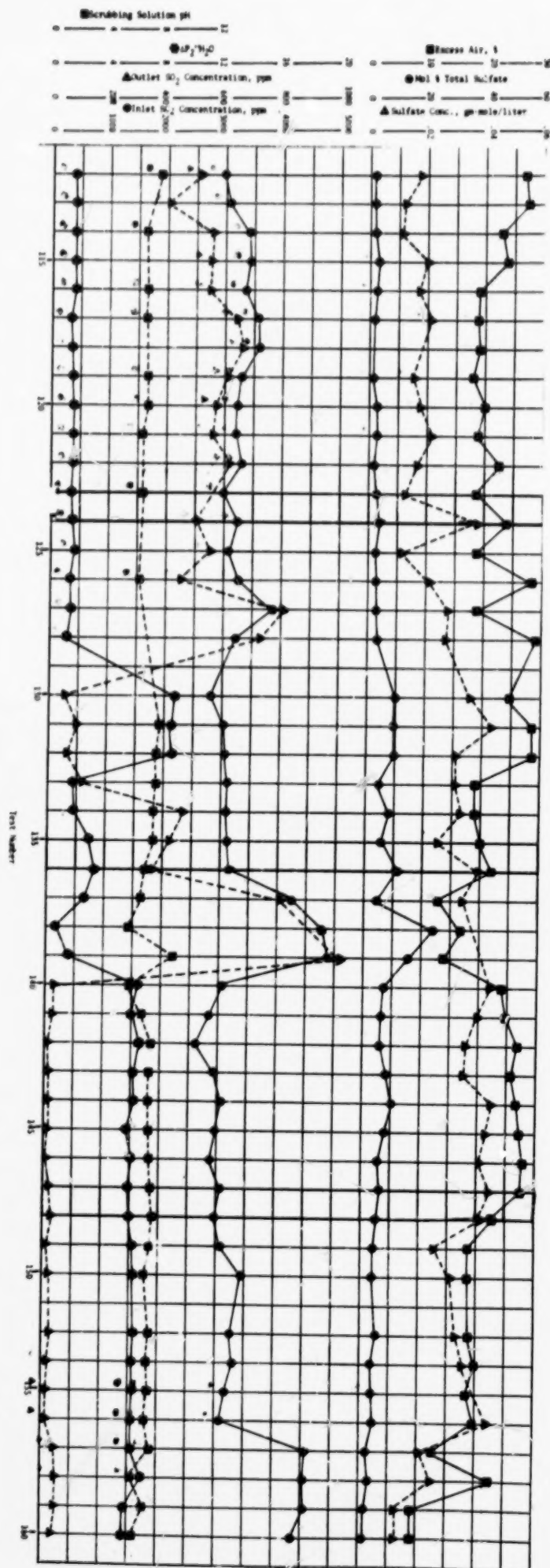
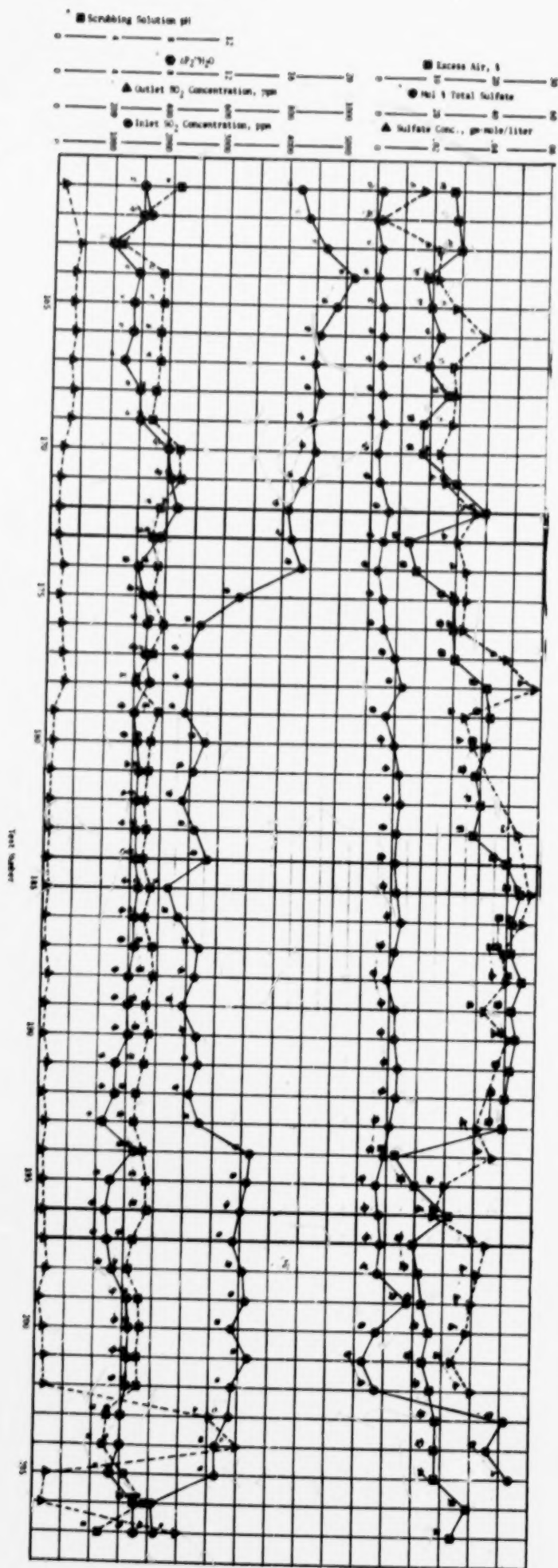
RUN NO.	GAS FLOW AT PILOT PL EXIT	GAS TEMP AT PILOT PL EXIT	FURNACE EXCESS AIR	SO2 ABSP EFF	SO2 ABSP ACROSS ABSORBER	KGA FOR SO2 ABSP # MOLES /HR-FT2	GAS VEL IN ABSORB	L/G IN ABSORB	PRES DP ACROSS ABSORB	ABSORB SLURRY PH	ABSORB SLURRY SUSPENDED SOLIDS #/100#LIQ	SULFATE CONC GRAM- MOLES/L
	#/HR	DEG F	%	*****	*****		FT/SEC	#/#	IN WG			
L-149	5739.	125.0	19.0	*****	*****	61.5	12.2	5.0	6.4	7.50	*****	0.0268
L-150	5704.	128.0	19.0	*****	*****	53.3	12.2	5.0	6.5	7.00	*****	0.0314
L-151	5738.	128.0	19.0	*****	*****	52.7	10.3	5.1	6.6	6.80	*****	0.0245
L-152	5846.	128.0	21.4	*****	*****	49.5	10.6	4.9	6.4	6.80	8.604	0.0346
L-153	5065.	125.0	19.0	*****	*****	44.1	10.7	5.7	6.4	7.50	*****	0.0337
L-154	5056.	126.0	20.0	*****	*****	46.3	10.7	5.4	6.4	7.50	*****	0.0355
L-155	4977.	127.0	19.0	*****	*****	49.8	10.6	5.5	6.4	7.60	*****	*****
L-156	5034.	127.0	20.5	*****	*****	49.2	10.8	5.4	6.3	7.50	*****	0.0434
L-157	6303.	126.0	12.4	*****	*****	51.6	13.1	4.6	6.2	7.60	16.096	0.0210
L-158	5922.	125.0	22.9	*****	*****	49.2	12.6	4.8	6.4	6.40	11.806	0.0254
L-159	5980.	130.0	9.5	*****	*****	47.8	12.5	4.6	6.2	7.20	*****	0.0125
L-160	6092.	130.0	9.5	*****	*****	50.2	12.7	4.8	6.0	6.40	*****	0.0128
L-161	6047.	128.0	13.3	*****	*****	56.3	12.8	4.7	6.0	8.40	*****	0.0157
L-162	6047.	130.0	14.3	*****	*****	-132.6	12.8	4.7	6.2	6.00	*****	0.0
L-163	6116.	130.0	14.3	*****	*****	44.4	12.7	4.7	6.2	1.06	16.441	0.0221
L-164	6136.	132.0	9.5	*****	*****	47.8	12.9	4.5	5.8	7.30	*****	0.0203
L-165	6165.	129.0	9.5	*****	*****	49.5	12.8	4.4	5.4	7.30	7.981	0.0281
L-166	6155.	130.0	11.4	*****	*****	47.7	12.9	4.4	5.6	7.20	*****	0.0370
L-167	6114.	128.0	10.0	*****	*****	48.0	12.7	4.7	6.0	7.30	*****	0.0277
L-168	6101.	128.0	13.8	*****	*****	47.7	12.7	4.5	6.0	*****	*****	*****
L-169	6081.	130.0	9.5	*****	*****	49.6	12.8	4.5	6.2	6.70	9.412	0.0270
L-170	6241.	132.0	9.5	*****	*****	54.9	13.2	4.4	8.2	8.20	*****	0.0231
L-171	5979.	138.0	14.3	*****	*****	54.2	13.0	4.5	8.6	8.50	11.230	0.0258
L-172	6010.	140.0	19.0	*****	*****	56.6	12.9	4.5	8.6	7.20	*****	0.0374
L-173	6172.	134.0	7.1	*****	*****	54.1	13.1	4.4	7.0	6.90	*****	0.0265
L-174	6087.	129.0	8.6	*****	*****	49.3	12.8	4.5	6.0	7.30	*****	0.0323
M-175	6116.	124.0	15.2	*****	*****	57.1	12.2	4.3	6.8	7.10	7.491	0.0323
M-176	6116.	124.0	15.2	*****	*****	48.2	12.2	4.3	6.8	8.20	*****	0.0324
M-177	6116.	124.0	15.2	*****	*****	47.7	12.2	4.3	6.8	7.40	*****	0.0482
M-178	5773.	124.0	21.0	*****	*****	40.3	11.9	4.5	6.8	6.50	*****	0.0590
M-179	6028.	127.0	21.4	*****	*****	51.7	12.4	4.4	6.0	7.80	7.136	0.0334
M-180	6017.	129.0	21.0	*****	*****	60.1	12.4	4.4	6.2	7.20	*****	0.0379
M-181	6295.	128.0	19.5	*****	*****	61.0	13.1	4.3	6.6	7.00	*****	0.0439
M-182	6286.	129.0	20.0	*****	*****	60.4	13.1	4.3	6.5	6.80	*****	0.0600
M-183	6295.	129.0	19.0	*****	*****	64.3	13.1	4.3	6.6	6.80	*****	0.0531
M-184	6387.	128.0	24.8	*****	*****	71.1	13.4	4.1	6.4	6.60	*****	0.0619
M-185	6383.	128.0	27.6	*****	*****	73.7	13.4	4.1	6.4	7.50	7.066	0.0575
M-186	6389.	127.0	25.7	*****	*****	78.5	13.4	4.0	6.4	6.80	*****	0.0541

RUN NO.	GAS FLOW AT PILOT PL EXIT	GAS TEMP AT PILOT PL EXIT	FURNACE EXCESS AIR	SO2 ABSORB EFF	KGA FOR SC2 ABSORB	GAS VEL IN	L/G IN ABSORB	PRES DP ACROSS ABSORB	ABSORB SLURRY PH	ABSORB SLURRY SUSPENDED	SULFATE CONC
	#/HR	DEG F	%	ABSORBER	# MOLES /HR-FT2	FT/SEC	#/#	IN WG		SOLIDS #/100FLIQ	GRAM- MOLES/L
M-187	6512.	128.0	26.2	*****	74.3	13.8	4.0	6.2	7.60	*****	0.0497
M-188	6330.	130.0	27.6	*****	71.5	13.2	4.0	6.0	7.70	*****	0.0497
M-189	5924.	129.0	25.7	*****	63.5	12.3	4.5	6.0	*****	*****	0.0413
M-190	5936.	128.0	26.7	*****	62.6	12.3	4.5	6.0	7.50	*****	0.0531
M-191	5885.	127.0	25.7	*****	55.1	12.1	4.5	5.2	7.30	*****	0.0659
M-192	5884.	127.0	25.2	*****	58.7	12.1	4.5	5.4	6.80	*****	0.0669
M-193	0.	128.0	24.8	*****	*****	*****	*****	*****	6.80	*****	0.0423
M-194	5988.	133.0	5.2	*****	59.6	13.0	4.3	6.8	6.80	*****	0.0472
M-195	6342.	136.0	9.5	*****	68.3	13.5	4.0	5.2	7.70	*****	0.0305
M-196	6106.	124.0	15.2	*****	63.7	12.2	4.3	0.8	7.70	*****	0.0275
M-197	6381.	138.0	9.5	*****	57.2	13.6	4.1	5.0	6.80	6.871	0.0442
M-198	6367.	136.0	10.5	*****	55.2	13.7	3.9	5.4	6.50	7.953	0.0428
M-199	6264.	133.0	11.4	*****	65.2	13.4	4.1	6.4	7.20	*****	0.0403
M-200	6412.	134.0	12.9	*****	59.7	13.6	3.9	6.5	7.10	*****	0.0393
M-201	6349.	133.0	13.3	*****	54.0	13.4	4.1	6.4	7.20	*****	0.0334
M-202	6280.	135.0	12.9	*****	54.8	13.4	3.7	6.4	7.30	*****	0.0413
N-203	6432.	124.0	14.3	*****	21.1	13.3	4.0	6.0	5.20	0.057	0.0505
N-204	6408.	126.0	14.3	*****	19.2	13.3	4.1	6.0	5.00	0.041	0.4866
N-205	6395.	127.0	14.3	*****	52.6	13.4	4.0	5.4	6.20	6.192	0.5210
O-206	5784.	135.0	19.0	*****	44.2	12.3	4.6	7.4	7.50	3.812	1.6987
O-207	5849.	135.0	17.1	*****	15.6	12.5	4.5	7.3	4.90	0.052	2.7042

VII. SUMMARY CURVES

The following are time-dependent curves of several of the more important parameters of the test program.





VIII. COMPUTER PRINTOUT

The following are the computer printout sheets for all runs during this Contract except for the first 11 tests which were voided because of various startup problems.

W. Downs

W. Downs

WD:jlr

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-012	CARD NUMBER	2	CARD NUMBER	3
DATE	12-12-69	WINDBOX ST,H2O	0.1070E 02	N.G. FLOW,%SCALE	0.9450E 02
TIME	1050	BURNER DP,H2O	0.7200E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.3400E 01	SCREW SPEED,RPM	0.3500E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX.%-BM	0.2700E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.4100E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2896E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.2750E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.4250E 03
ABS NOZ.,PSIG	0.2850E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.6000E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6800E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7180E 03	AIR HEATER #2	0.7100E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6150E 03	PRI.AIR FAN IN.	0.7650E 02
		NO.2 BANK OUT	0.4950E 03	PRI.AIR WGT BULB	0.5500E 02
CARD NUMBER	7	FURN. EXIT	0.1180E 03	SEC.AIR FAN IN.	0.2900E 02
MODE OF OPER.	2	COAL-AI		SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6100E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5300E 01	VENT.ABS.DP,H2O	0.1500E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.6500E 00	ABS CYC.DP,H2O	0.6400E 01	FBA SUMP DP,H2O	0.0
#1 URIF.DP,H2O	0.4700E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1300E 03	TEMP.THERMOMETERS,F	0.1350E 03	MAKEUP FLOWS	
#1 ORIFICE	0.6000E 02	PART.CYC.EXIT	0.1320E 03	PART.INIT.GAL	0.1624E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1340E 03	PART.FINAL,GAL	0.1634E 05
FBA EXIT	0.1230E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.3100E 02
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3429E 04
PART.CYC.SUMP	0.1230E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.3451E 04
ABS CYC.SUMP	0.6000E 02	MGO SLAK TANK	0.1020E 03	ABS H2O TIME,MIN	0.3100E 02
FBA SUMP	0.7600E 02	MGOH2 TANK		MGO ROTO.SCALE,%	0.1700E 02
MGO SLAK TANK	0.9800E 02			MAKEUP SETTING	0.1700E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-012

DATE 12-12-69

TIME OF DAY 1050

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	118.0	-----	-----	-----	-----	0.005	43.6	489.	23.0
SECONDARY AIR	4973.	645.0	-----	-----	-----	-----	0.005	42.6	4949.	10.7
FURNACE EXIT	5916.	495.0	2491.6	-----	363.	-----	0.049	111.0	5642.	4.1
PART.SCRB.INLET	5916.	425.0	-----	-----	-----	-----	0.049	111.0	-----	2.7
PART.CYC.EXIT	5932.	135.0	2238.6	-----	-----	-----	0.103	134.1	5377.	-8.8
VENT ABS.INLET	5932.	135.0	-----	-----	-----	-----	0.103	134.1	-----	-13.5
ABS CYC.EXIT	5947.	132.0	-----	-----	-----	-----	0.094	129.5	-----	-24.4
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT DRIF.	5947.	123.0	805.7	-----	781.	-----	0.094	129.5	5436.	-24.4

SCRUBBER STREAM DATA

	TEMP.,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA	TEMP.,F	FLOW,#/M
PARTICULATE	60.0	3.32	MAKEUP WATER	TEMP.,F FLOW,#/M	TEMP.,F	FLOW,#/M	FLOW,#/M
MAKEUP WATER	134.0	2.77	MAKEUP MGD SL.	60.0 5.8	-----	-----	-----
PRODUCT LIQ.	134.0	18.90	PRODUCT LIQ.	98.0 3.1	-----	-----	-----
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ)	132.0 12.9	-----	-----	-----
	-----	-----	REC.(FLOW NOZ.)	132.0 623.7	-----	-----	-----
	-----	-----		542.4	-----	-----	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.598E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	475.6
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	12.9
OXYGEN,DRY,MEAS.	2.70
CO2,DRY-CALC.	15.75
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	10.15
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	158.7
LIQ/GAS,GAL/MCF	12.0
LIQ/GAS,#/#	1.6
PRES.DROP,IN.WG	6.1

VENT ABS.

VENT ABS.	64.01
-----	-----
-----	-----
-----	-----
-----	-----
-----	77.6
-----	39.9
-----	5.5
-----	1.5

FLOAT.BED

-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	66.7
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	34.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	-----
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	-----

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0156
MOL% TOTAL SULF=	2.28
O2 AT FURN. EX.=	2.70
O2 AT ABSORB.IN=	-----
O2 AT ABSORB.EX=	-----

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-012

DATE 12-12-69

TIME OF DAY 1050

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	17.60			35.19	255.4	5632.	
OUTPUT, #/HR	14.64			*****	273.9	5642.	
PART. SCRUBBER							
INPUT, #/HR	14.64			*****	1937.	5642.	
OUTPUT, #/HR	12.53			*****	1938.	5377.	
SO2 ABSORBERS							
INPUT, #/HR	12.53		8.67	*****	1072.	5377.	
OUTPUT, #/HR	21.81		10.07	*****	1281.	5436.	

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE			
MONO(TOTAL)	4.37	0.6827	----
MONO(DISSOLVED)	3.37	0.5268	----
MONO(SOLID)	1.00	0.1560	----
BISULFITE	2.37	0.3708	----
MGO	*****	*****	*****
SULFATE	*****	*****	*****
MAGNESIUM	0.0	0.0	0.0
FLYASH	0.10	0.0156	0.187
SOLIDS, MG	3.47	0.5424	----
	----	----	*****
	----	----	3.201

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.
INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.487410
HYDROGEN 0.515836
OXYGEN 1.391987
NITROGEN 5.037249
SULFUR 0.009286

FEED RATE, #/SEC= 1.64

ENTHALPY, BTU/# = -128.

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 7.80
MGO PRESKAKED, NO=0, YES=1 0
& SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.40
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.30
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-013	CARD NUMBER	2	3
DATE	12-12-69	WINDBOX ST,H2O	0.1080E 02	N.G. FLOW,%SCALE 0.9450E 02
TIME	1230	BURNER DP,H2O	0.7200E 01	N.G. STATIC,R.O. 0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.3500E 01	SCREW SPEED,RPM 0.3600E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-.1800E 01	O2 FURN.EX.%-BM 0.2800E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.% 0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.4400E 01	ELE.CHEM.MILVOLT 0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F 0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG 0.2898E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.2750E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.2400E 02	SEC. AIR ORIF.	0.9000E 02	PART. SCRUB. IN	
ABS NOZ., PSIG	0.1300E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.4400E 03
ABS LOAD, PSIG	0.1000E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.1400E 03
ABS ORIF. INCH	0.2800E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.0
ABSORBER NOZ. CODE		WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE		NO.1 BANK OUT	0.7350E 03	PRI. AIR FAN IN.	0.7050E 03
		NO.2 BANK OUT	0.6250E 03	PRI. AIR WGT BULB	0.7700E 02
		FURN. EXIT	0.5000E 03	SEC. AIR FAN IN.	0.5500E 02
		COAL-AIR	0.1180E 03	SEC. AIR FAN IN.	0.2950E 02
				SEC. AIR WGT BULB	0.3200E 02

	8	9
PART.SCR.DP,H20	0.6100E 01	
PART.CYC.DP,H20	0.5500E 01	
#1 ORIF.ST,HG	-0.5500E 00	
#1 ORIF.DP,H20	0.4700E 01	
		CARD NUMBER
	0.1500E 01	FBA INLET ST,HG
	0.4800E 01	FBA SUMP DP,H20
		FBA DP,H20
		FBA DEMIST.DP,H20

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1300E 03	PART.CYC.EXIT	0.1350E 03	PART.INIT.GAL	0.1591E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1320E 03	PART.FINAL,GAL	0.1601E 05
FBA EXIT	0.6000E 02	PART.CYC.SUMP	0.1330E 03	PART.TIME,MIN	0.3200E 02
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.1270E 03	ABS H20 IN.GAL	0.3354E 04
PART.CYC.SUMP	0.1260E 03	FBA SUMP	0.0	ABS H20 FI.GAL	0.3380E 04
ABS CYC.SUMP	0.1260E 02	MGO SLAK TANK	0.0	ABS H20 TIME,MIN	0.3200E 02
FBA SUMP	0.6000E 02	MGOH2 TANK	0.1020E 03	MGO RDTG.SCALE,%	0.1800E 02
MGO SLAK TANK	0.7500E 02			MAKEUP SETTING	0.1800E 02
MGOH2 TANK	0.9900E 02				
MAKEUP WATER	0.6000E 02				

STAT
PRES
IN. H2O

489.
4951.
5643.

5370.

5410.

FBA
TEMP, F F

VENT ABS.
69.44

77.5
25.6
3.5
1.5

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0146
MOL% TOTAL SULF=	2.56
02 AT FURN.EX.=	2.80
02 AT ABSORB.IN=	*****
02 AT ABSORB.EX=	*****

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-013

DATE 12-12-69

TIME OF DAY 1230

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	17.51	-----	35.01	253.7	5633.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	19.30	-----	17.38	272.2	5643.	CARBON 0.484992
PART. SCRUBBER						HYDROGEN 0.512592
INPUT, #/HR	19.30	-----	17.38	1883.	5643.	OXYGEN 1.392269
OUTPUT, #/HR	18.56	-----	*****	1953.	5370.	NITROGEN 5.039474
						SULFUR 0.009239
SO2 ABSORBERS						FEED RATE, #/SEC= 1.64
INPUT, #/HR	18.56	8.65	0.52	1151.	5370.	ENTHALPY, BTU/# = -73.
OUTPUT, #/HR	21.02	8.04	*****	1353.	5410.	

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = 7.60
FREE	3.59	0.5610	-----	MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	2.48	0.3877	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	1.11	0.1733	-----	
MONO(SOLID)	1.37	0.2143	-----	
BISULFITE	*****	*****	*****	PRODUCT MG BASE PHYSICAL PROPERTIES
MGO	*****	*****	*****	ACID STRENGTH, PH = 5.20
SULFATE	0.0	0.0	0.0	SP.GRAVITY, HYDROM. = *****
MAGNESIUM	0.09	0.0146	0.175	
FLYASH	2.57	0.4022	-----	PARTICULATE SCRUBBER PRODUCT
SOLIDS, MG	-----	-----	*****	ACID STRENGTH, PH = 2.20
			1.475	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-014	CARD NUMBER	2	CARD NUMBER	3
DATE	12-12-69	WINDBOX ST,H20	0.1100E 02	N.G. FLOW,%SCALE	0.9450E 02
TIME	1500	BURNER DP,H20	0.7200E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H20	0.3700E 01	SCREW SPEED,RPM	0.3650E 03
PRI.AIR DP,H20	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX.%-BM	0.2800E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H20	0.4900E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX-ST,H20	0.4800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2896E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.2750E 02	TEMP.FURN.RECORDER,F	0.8800E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.2400E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.4450E 03
ABS NOZ.,PSIG	0.1300E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.1000E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.2800E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7600E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6450E 03	PRI.AIR FAN IN.	0.7600E 02
		NO.2 BANK OUT	0.6450E 03	PRI.AIR WGT BULB	0.5400E 02
		FURN. EXIT	0.5150E 03	SEC.AIR FAN IN.	0.3200E 02
		COAL-AIR	0.1190E 03	SEC.AIR WET BULB	0.2800E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.		VENT.ABS.DP,H20	0.1500E 01	FBA INLET ST,HG	0.0
PART.SCR.ST,HG	0.3000E 00	ABS CYC.DP,H20	0.0	FBA SUMP DP,H20	0.0
PART.SCR.DP,H20	0.5900E 01			FBA DP,H20	0.0
PART.CYC.DP,H20	0.5500E 01			FBA DEMIST.DP,H20	0.0
#1 ORIF.ST,HG	-0.5000E 00				
#1 ORIF.DP,H20	0.4700E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART.CYC.EXIT	0.1360E 03	PART.INIT.GAL	0.1671E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1350E 03	PART.FINAL,GAL	0.1679E 05
FBA EXIT	0.6000E 02	PART.CYC.SUMP	0.1340E 03	PART.TIME,MIN	0.2650E 02
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.1340E 03	ABS H2O IN.GAL	0.3500E 04
PART.CYC.SUMP	0.1270E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.3511E 04
ABS CYC.SUMP	0.1300E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.2650E 02
FBA SUMP	0.6000E 02	MGOH2 TANK	0.1020E 03	MGO ROTO.SCALE,%	0.3100E 02
MGO SLAK TANK	0.7700E 02			MAKEUP SETTING	0.3100E 02
MGOH2 TANK	0.9800E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-014

DATE 12-12-69

TIME OF DAY 1500

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	119.0	---	---	---	---	0.005	41.3	489.	23.0
SECONDARY AIR	4985.	642.5	---	---	---	---	0.003	28.5	4971.	11.0
FURNACE EXIT	5927.	515.0	2770.4	---	---	---	0.046	109.6	5664.	4.8
PART.SCRB.INLET	5927.	445.0	-----	-----	-----	-----	0.046	109.6	---	4.1
PART.CYC.EXIT	5939.	136.0	2684.5	-----	856.	0.0936	0.105	134.8	5375.	-6.8
VENT' ABS.INLET	5939.	136.0	-----	-----	-----	-----	0.105	134.8	---	-11.5
ABS CYC.EXIT	5986.	135.0	-----	-----	-----	-----	0.094	129.6	---	-24.4
FLOATING BED IN	*****	*****	-----	-----	-----	-----	*****	*****	---	*****
FLOATING BED EX	*****	*****	-----	-----	-----	-----	*****	*****	---	*****
P.P. EXIT ORIF.	5986.	127.0	304.4	-----	106.	-----	0.094	129.6	5471.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FRA
PARTICULATE					
MAKEUP WATER	60.0	3.25	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	134.0	2.77	MAKEUP MGO SL.	60.0 3.5	*****
RECIRCULATED LIQ.	134.0	18.90	PRODUCT LIQ.	98.0 4.1	*****
			REC.(SPRAY NOZ)	134.0 13.2	*****
			REC.(FLOW NOZ.)	378.0 348.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.597E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	474.9
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	13.3
OXYGEN,% DRY, MEAS.	2.80
CO2,% DRY-CALC.	15.66
HUMIDITY,#/# - CALC.	0.046

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	3.10
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	158.6
LIQ/GAS,GAL/MCF	12.0
LIQ/GAS,#/#	1.6
PRES.DROP,IN.WG	5.9

FLOAT.BED

VENT ABS.	88.66

	87.58
	78.5
	25.3
	3.5
	1.5

SO2 ABSORPTION PARAMETERS

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FT2,	=	143.0	KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****	SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	2.6	SUMP RESID.TIME,MIN	=	*****

FLOATING BED ABSORBER

CONC.,GM-MOLE/L=	0.0299
MOL% TOTAL SULF=	2.36
O2 AT FURN.EX.=	2.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-014

DATE 12-12-69

TIME OF DAY 1500

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE
INPUT, #/HR 17.57
OUTPUT, #/HR 16.34
PART. SCRUBBER
INPUT, #/HR 16.34
OUTPUT, #/HR 15.03
SULFUR 17.57
MAGNESIUM 35.14
FLYASH 244.8
WATER 263.3
DRY GAS 5654.
5664.
1887.
1947.
5664.
5375.

FEED RATE, #/SEC = 1.65

ENTHALPY, BTU/# = 843.

*

*SO2 ABSORBERS-
PRODUCT COMP.
TOTAL, 8.85
COMBINED 8.85
FREE 0.0
MONO(TOTAL) 8.85
MONO(DISSOLVED) *****
MONO(SOLID) *****
BISULFITE *****
MGO 0.04
SULFATE 0.19
MAGNESIUM 9.08
FLYASH -----
SOLIDS, MG -----

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.70
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.20
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.20
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-015	CARD NUMBER	2	CARD NUMBER	3
DATE	12-12-69	WINDBOX ST,H20	0.1130E 02	N.G. FLOW,SCALE	0.9450E 02
TIME	1645	BURNER DP,H20	0.7000E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H20	0.4400E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H20	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX,8-BM	0.2700E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H20	0.4800E 01	COMB.FURN,EX,8	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX,ST,H20	0.5200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2896E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.2750E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.2400E 02	SEC.AIR ORIF.	0.8500E 02	PART.SCRUB.IN	0.4600E 03
ABS NOZ.,PSIG	0.2800E 02	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.4900E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6200E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6420E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7750E 03	PRI.AIR FAN IN.	0.7700E 02
		NO.2 BANK OUT	0.6650E 03	PRI.AIR WGT BULB	0.5450E 02
CARD NUMBER	7	FURN. EXIT	0.5250E 03	SEC.AIR FAN IN.	0.2700E 02
MODE OF OPER.	2	COAL-AIR	0.1180E 03	SEC.AIR WET BULB	0.2700E 02
PART.SCR.ST,HG	0.3000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H20	0.6100E 01	VENT.ABS.DP,H20	0.1400E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H20	0.5400E 01	ABS CYC.DP,H20	0.4900E 01	FBA SUMP DP,H20	0.0
#1 ORIF.ST,HG	-0.5000E 00			FBA DP,H20	0.0
#1 ORIF.DP,H20	0.4700E 01			FBA DEMIST.DP,H20	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1330E 03	PART.CYC.EXIT	0.1380E 03	PART.INIT.GAL	0.1705E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1340E 03	PART.FINAL,GAL	0.1712E 05
FBA EXIT	0.6000E 02	PART.CYC.SUMP	0.1370E 03	PART.TIME,MIN	0.2250E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.1340E 03	ABS H20 IN,GAL	0.3564E 04
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.6000E 02	ABS H20 FI,GAL	0.3583E 04
ABS CYC.SUMP	0.1280E 03	MGO SLAK TANK	0.6000E 02	ABS H20 TIME,MIN	0.2250E 02
FBA SUMP	0.6000E 02	MGOH2 TANK	0.1000E 03	MGO ROTO,SCALE,8	0.3100E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.3100E 02
MGOH2 TANK	0.9500E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-015

DATE 12-12-69

TIME OF DAY 1645

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	118.0	---	---	---	---	0.005	41.6	489.	23.0
SECONDARY AIR	4998.	636.8	---	---	---	---	0.004	33.9	4980.	11.3
FURNACE EXIT	5943.	525.0	2812.7	---	---	---	0.047	110.2	5675.	5.2
PART.SCRB.INLET	5943.	460.0	-----	-----	-----	-----	0.047	110.2	---	4.1
PART.CYC.EXIT	5924.	138.0	2769.4	-----	-----	0.0537	0.108	135.8	5346.	-6.8
VENT ABS.INLET	5924.	138.0	-----	-----	-----	-----	0.108	135.8	---	-11.5
ABS CYC.EXIT	5912.	134.0	-----	-----	-----	-----	0.099	131.3	---	-24.4
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	---	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	---	-----
P.P. EXIT ORIF.	5912.	128.0	290.7	-----	-----	-----	0.099	131.3	5378.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	3.24	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	137.0	2.77	MAKEUP MGO SL.	60.0 7.0	-----
PRODUCT LIQ.	137.0	18.90	PRODUCT LIQ.	95.0 4.1	-----
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	134.0 13.9	-----
			REC.(FLOW NOZ.)	134.0 617.3	-----
				517.9	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.601E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	478.4
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	12.9
OXYGEN,% DRY, MEAS.	2.70
CO2,% DRY-CALC.	15.75
HUMIDITY,#/# - CALC.	0.047

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FIT2, = 145.5
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = 2.4

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.54
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	158.9
LIQ/GAS,GAL/MCF	12.0
LIQ/GAS,#/#	1.6
PRES.DROP,IN.WG	6.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FIT2 = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

VENT ABS.

89.50

77.6
38.1
5.3
1.4

FLOAT.BED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0232
 MOL% TOTAL SULF= 3.52
 O2 AT FURN.EX.= 2.70
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-015

DATE 12-12-69

TIME OF DAY 1645

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	17.70	---	---	35.40	249.9	5665.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	16.62	---	---	*****	268.4	5675.	CARBON 0.487440
PART-SCRUBBER		16.62	---	*****	1892.	5675.	HYDROGEN 0.511904
INPUT, #/HR	15.41	---	---	*****	1962.	5346.	OXYGEN 1.391990
OUTPUT, #/HR	15.41	---	---	*****	---	---	NITROGEN 5.037218
SO2 ABSORBERS		15.41	11.58	0.48	1229.	5346.	SULFUR 0.009287
INPUT, #/HR	20.21	13.43	*****	*****	1363.	5378.	FEED RATE, #/SEC= 1.65
OUTPUT, #/HR	---	---	---	---	---	---	ENTHALPY, BTU/# = 337.

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	4.32	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	4.15	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = 7.80
FREE	0.17	---	---	---	MGO PRESLAKED, MGO=0, YES=1 0
MONO(TOTAL)	3.98	---	---	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	*****	---	---	---	PRODUCT MG BASE PHYSICAL PROPERTIES
MONO(SOLID)	*****	---	---	---	ACID STRENGTH, PH = 7.00
BISULFITE	*****	---	---	---	SP.GRAVITY, HYDROM. = *****
MGO	0.0	---	---	---	---
SULFATE	0.15	---	---	---	---
MAGNESIUM	4.30	---	---	---	---
FLYASH	---	---	---	---	---
SOLIDS, MG	---	---	---	---	---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 3.20
FLYASH CONC. GM/100ML = *****

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-016	CARD NUMBER	2	CARD NUMBER	3
DATE	12-15-69	WINDBOX ST,H2O	0.1030E 02	N.G. FLOW,%SCALE	0.9650E 02
TIME	1235	BURNER DP,H2O	0.7200E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.3100E 01	SCREW SPEED,RPM	0.3650E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX.%-BM	0.2700E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2884E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.9700E 02	PART.SCRUB.IN	0.4820E 03
ABS NOZ.,PSIG	0.2800E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1420E 03
ABS LOAD,PSIG	0.4600E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6400E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7050E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7100E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7850E 03	PRI.AIR FAN IN.	0.7750E 02
CARD NUMBER	7	NO.2 BANK OUT	0.6800E 03	PRI.AIR WGT BULB	0.5700E 02
MODE OF OPER.	2	FURN. EXIT	0.5220E 03	SEC.AIR FAN IN.	0.3200E 02
PART.SCR.ST,HG	0.2750E 00	COAL-AIR	0.1150E 03	SEC.AIR WET BULB	0.3100E 02
PART.SCR.DP,H2O	0.6300E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5700E 01	VENT.ABS.DP,H2O	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H2O	0.5800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4900E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1360E 03	PART.CYC.EXIT	0.1380E 03	PART.INIT.GAL	0.1797E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1340E 03	PART.FINAL,GAL	0.1800E 05
FBA EXIT	0.6000E 02	PART.CYC.SUMP	0.1360E 03	PART.TIME,MIN	0.1100E 02
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.1320E 03	ABS H2O IN.GAL	0.3877E 04
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.6000E 02	ABS H2O FI.GAL	0.3886E 04
ABS CYC.SUMP	0.1280E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.1100E 02
FBA SUMP	0.6000E 02	MGOH2 TANK	0.8200E 02	MGO ROTO.SCALE,%	0.1700E 02
MGO SLAK TANK	0.7500E 02			MAKEUP SETTING	0.1700E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-016

DATE 12-15-69

TIME OF DAY 1235

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	502.	115.0					0.006	48.1	499.	23.0
SECONDARY AIR	4933.	646.3					0.004	36.7	4914.	10.3
FURNACE EXIT	5885.	522.0	3262.4		998.	3.0647	0.048	110.3	5616.	3.8
PART.SCRB.INLET	5885.	482.0					0.048	110.3		3.7
PART.CYC.EXIT	5997.	138.0	3262.4			0.0184	0.113	136.6		-10.8
VENT ABS.INLET	5997.	138.0					0.113	136.6		-15.7
ABS CYC.EXIT	6020.	134.0					0.103	132.4		-24.4
FLOATING BED IN	*****	*****					*****	*****		*****
FLOATING BED EX	*****	*****					*****	*****		*****
P.P. EXIT ORIF.	6020.	127.0	697.1	*****	1123.	*****	0.103	132.4	5457.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	3.00		60.0	6.8
MAKEUP WATER	136.0	2.77	MAKEUP MGO SL.	80.0	3.1
PRODUCT LIQ.	136.0	23.76	PRODUCT LIQ.	132.0	13.4
RECIRCULATED LIQ.			REC.(SPRAY NO2)	132.0	617.3
			REC.(FLOW NO2.)		526.2

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.595E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	473.1
NAT.GAS FLOW,#/HR	8.7
% EXCESS AIR	12.9
OXYGEN,% DRY, MEAS.	2.70
CO2,% DRY-CALC.	15.75
HUMIDITY,#/# - CALC.	0.048

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2	= 101.1
SULFITE/SO2-MOL/MOL	= *****
SUMP RESID.TIME,MIN	= 2.5

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	-0.0
FLYASH COL.EFF	99.40
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	163.7
LIQ/GAS,GAL/MCF	14.6
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.3

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	= *****
SULFITE/SO2-MOL/MOL	= *****
SUMP RESID.TIME,MIN	= *****

VENT ABS.

78.63

79.5
37.8
5.2
1.7

FLOAT.BED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0161
MOL% TOTAL SULF=	2.69
O2 AT FURN.EX.=	2.70
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-016

DATE 12-15-69

TIME OF DAY 1235

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	17.50	---	35.01	249.8	5606.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	19.08	---	28.72	268.7	5616.	CARBON 0.487284
PART. SCRUBBER						HYDROGEN 0.526003
INPUT, #/HR	19.08	---	28.72	1770.	5616.	OXYGEN 1.391975
OUTPUT, #/HR	18.30	---	*****	1992.	5389.	NITROGEN 5.037372
						SULFUR 0.009279
SO2 ABSORBERS						FEED RATE, #/SEC = 1.64
INPUT, #/HR	18.30	8.67	0.17	1188.	5389.	ENTHALPY, BTU/# = 256.
OUTPUT, #/HR	19.70	9.55	*****	1368.	5457.	
*SO2 ABSORBERS-						
PRODUCT COMP.	GM SO2/	GM-MOLE/	GRAM/			
	100ML	LITER	100ML			
TOTAL,	3.80	0.5935	---			MAKEUP MGO COMPOSITION
COMBINED	3.05	0.4761	---			SLURRY CONC. - GM MGO/100ML = 7.80
FREE	0.75	0.1174	---			MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	2.30	0.3586	---			% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	*****	*****	---			
MONO(SOLID)	*****	*****	---			PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	*****	*****	---			ACID STRENGTH, PH = 6.50
MGO	0.0	0.0	0.0			SP. GRAVITY, HYDROM. = *****
SULFATE	0.10	0.0161	0.194			
MAGNESIUM	3.15	0.4922	---			PARTICULATE SCRUBBER PRODUCT
FLYASH	---	---	---			ACID STRENGTH, PH = 3.20
SOLIDS, MG	---	---	2.699			FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-017					
DATE	12-15-69					
TIME	1555					
PRI. AIR ST, HG	0.1700E 01					
PRI. AIR DP, H2O	0.2400E 01					
SEC. AIR ST, HG	0.1700E 01					
SEC. AIR DP, H2O	0.2300E 01					
CARD NUMBER	2	CARD NUMBER	2	CARD NUMBER	3	
WINDBOX ST, H2O	0.1070E 02	N.G. FLOW, %SCALE	0.9600E 02	N.G. FLOW, %SCALE	0.9600E 02	
BURNER DP, H2O	0.7200E 01	N.G. STATIC, R.O.	0.8900E 01	N.G. STATIC, R.O.	0.8900E 01	
FURN. ST, H2O	0.3500E 01	SCREW SPEED, RPM	0.3750E 03	SCREW SPEED, RPM	0.3750E 03	
PP EXIT ST, HG	-0.1800E 01	02 FURN. EX. % - BM	0.2600E 01	02 FURN. EX. % - BM	0.2600E 01	
PP EXIT DP, H2O	0.5100E 01	COMB. FURN. EX. %	0.0	COMB. FURN. EX. %	0.0	
FURN. EX. ST, H2O	0.4200E 01	ELE. CHEM. MILVOLT	0.0	ELE. CHEM. MILVOLT	0.0	
PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0	CELL TEMP, F	0.0	
P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2884E 02	BAROMETRIC, HG	0.2884E 02	
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6	
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED		
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.9700E 02	PART. SCRUB. IN	0.4800E 03	
ABS NOZ., PSIG	0.1300E 02	WINDBOX - TOP	0.6600E 03	#1 ORIFICE	0.1420E 03	
ABS LOAD, PSIG	0.1050E 02	WINDBOX - WEST	0.6350E 03	FBA INLET	0.0	
ABS ORIF. INCH	0.2600E 01	WINDBOX - BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03	
ABSORBER NOZ. CODE	6	WINDBOX - EAST	0.6500E 03	AIR HEATER #2	0.7050E 03	
MANOMETER CODE	0	NO.1 BANK OUT	0.7950E 03	PRI. AIR FAN IN.	0.7800E 02	
CARD NUMBER	7	NO.2 BANK OUT	0.6850E 03	PRI. AIR WGT BULB	0.5800E 02	
MODE OF OPER.	2	FURN. EXIT	0.5200E 03	SEC. AIR FAN IN.	0.3200E 02	
PART. SCR. ST, HG	0.2500E 00	COAL - AIR	0.1150E 03	SEC. AIR WGT BULB	0.3100E 02	
PART. SCR. DP, H2O	0.6300E 01	CARD NUMBER	8	CARD NUMBER	9	
PART. CYC. DP, H2O	0.5700E 01	VENT. ABS. DP, H2O	0.1500E 01	FBA INLET ST, HG	0.0	
#1 ORIF. ST, HG	-0.7000E 00	ABS CYC. DP, H2O	0.4800E 01	FBA SUMP DP, H2O	0.0	
#1 ORIF. DP, H2O	0.4900E 01	CARD NUMBER	11	FBA DP, H2O	0.0	
CARD NUMBER	10	TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.0	
TEMP. PILOT RECORDER, F		PART. CYC. EXIT	0.1380E 03	CARD NUMBER	12	
#1 ORIFICE	0.1360E 03	ABS CYC. EXIT	0.1360E 03	MAKEUP FLOWS		
FBA INLET	0.6000E 02	PART. CYC. SUMP	0.1370E 03	PART. INIT. GAL	0.1822E 05	
FBA EXIT	0.6000E 02	ABS CYC. SUMP	0.1350E 03	PART. FINAL, GAL	0.1830E 05	
P.P. EXIT	0.1290E 03	FBA SUMP	0.6000E 02	PART. TIME, MIN	0.2200E 02	
PART. CYC. SUMP	0.1300E 03	MGO SLAK TANK	0.6000E 02	ABS H2O IN. GAL	0.3931E 04	
ABS CYC. SUMP	0.1310E 03	MGOH2 TANK	0.8400E 02	ABS H2O FI. GAL	0.3948E 04	
FBA SUMP	0.6000E 02	CARD NUMBER	12	ABS H2O TIME, MIN	0.2200E 02	
MGO SLAK TANK	0.7400E 02	MAKEUP WATER	0.6000E 02	MGO ROTO. SCALE, %	0.1700E 02	
MGOH2 TANK	0.8200E 02			MAKEUP SETTING	0.1700E 02	
MAKEUP WATER	0.6000E 02					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-017

DATE 12-15-69

TIME OF DAY 1555

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	502.	115.0	---	---	---	---	0.007	50.1	490.	23.0
SECONDARY AIR	4933.	646.3	---	---	---	---	0.004	36.7	4914.	10.7
FURNACE EXIT	5887.	520.0	3183.2	---	---	---	0.048	110.5	5617.	4.2
PART.SCRB.INLET	5887.	480.0	---	---	---	---	0.048	110.5	---	3.4
PART.CYC.EXIT	6007.	138.0	3145.3	---	1209.	0.0257	0.114	137.1	5392.	-9.5
VENT ABS.INLET	6007.	138.0	---	---	---	---	0.114	137.1	---	-14.4
ABS CYC.EXIT	6066.	136.0	---	---	---	---	0.106	133.2	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6066.	129.0	704.5	---	1055.	*****	0.106	133.2	5485.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	3.32	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	137.0	2.77	MAKEUP MGO SL.	60.0 6.3	*****
PRODUCT LIQ.	137.0	23.76	PRODUCT LIQ.	82.0 3.1	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	135.0 11.5	*****
			REC.(FLOW NOZ.)	135.0 378.0	*****
				335.4	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.598E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	475.7
NAT.GAS FLOW,#/HR	8.7
% EXCESS AIR	12.4
OXYGEN,%DRY,MEAS.	2.60
CO2,%DRY-CALC.	15.83
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.19
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	163.4
LIQ/GAS,GAL/MCF	14.7
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.3

FLOAT.BED

VENT ABS.	77.60
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 98.5
SULFITE/SO2-MOL/MOL = *****
SUMP RESID.TIME,MIN = 2.9

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME,MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0146
MOL% TOTAL SULF= 2.44
O2 AT FURN. EX.= 2.60
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-017 DATE 12-15-69 TIME OF DAY 1555

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	17.60	-----	35.20	251.4	5607.	
OUTPUT, #/HR	18.61	-----	*****	270.1	5617.	
PART. SCRUBBER						
INPUT, #/HR	18.61	-----	*****	1930.	5617.	
OUTPUT, #/HR	17.65	-----	*****	1998.	5392.	
SO2 ABSORBERS						
INPUT, #/HR	17.65	8.67	0.23	1165.	5392.	
OUTPUT, #/HR	17.73	8.90	*****	1268.	5485.	

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE	3.89	0.6079	-----
MONO(TOTAL)	3.35	0.5234	-----
MONO(DISSOLVED)	0.54	0.0845	-----
MONO(SOLID)	2.81	0.4389	-----
BISULFITE	*****	*****	*****
MGO	*****	*****	*****
SULFATE	0.0	0.0	0.0
MAGNESIUM	0.09	0.0146	0.175
FLYASH	3.44	0.5380	-----
SOLIDS, MG	-----	-----	6.943

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.489727
HYDROGEN	0.532811
OXYGEN	1.391697
NITROGEN	5.035119
SULFUR	0.009328

FEED RATE, #/SEC= 1.64

ENTHALPY, BTU/# = 175.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	7.80
MGO PRESLAKED, NO=0, YES=1	0
% SLAKED TO MG(OH)2, MEAS. =	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	6.50
SP.GRAVITY, HYDROM. =	*****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	3.20
FLYASH CONC. GM/100ML =	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-018	CARD NUMBER	2	CARD NUMBER	3
DATE	12-15-69	WINDBOX ST, H2O	0.1060E 02	N.G. FLOW, %SCALE	0.9650E 02
TIME	1550	BURNER DP, H2O	0.7300E 01	N.G. STATIC, R.O.	0.8800E 01
PRI. AIR ST, HG	0.1700E 01	FURN. ST, H2O	0.3400E 01	SCREW SPEED, RPM	0.3800E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1800E 01	O2 FURN. EX. %BM	0.2600E 01
SEC. AIR ST, HG	0.1700E 01	PP EXIT DP, H2O	0.5100E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.4200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2887E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.9300E 02	PART. SCRUB. IN	0.4850E 03
ABS NOZ., PSIG	0.1300E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1420E 03
ABS LOAD, PSIG	0.1050E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.2600E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6430E 03	AIR HEATER #2	0.7100E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8400E 03	PRI. AIR FAN IN.	0.7800E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7050E 03	PRI. AIR WGT BULB	0.5750E 02
MODE OF OPER.	2	FURN. EXIT	0.5200E 03	SEC. AIR FAN IN.	0.3200E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR	0.1180E 03	SEC. AIR WET BULB	0.3200E 02
PART. SCR. DP, H2O	0.6300E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.4700E 01	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.8000E 00	ABS CYC. DP, H2O	0.4800E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4800E 01	CARD NUMBER	11	FBA DP, H2O	0.0
CARD NUMBER	10	TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.0
TEMP. PILOT RECORDER, F		PART. CYC. EXIT	0.1380E 03	CARD NUMBER	12
#1 ORIFICE	0.1360E 03	ABS CYC. EXIT	0.1360E 03	MAKEUP FLOWS	
FBA INLET	0.6000E 02	PART. CYC. SUMP	0.1380E 03	PART. INIT. GAL	0.1860E 05
FBA EXIT	0.6000E 02	ABS CYC. SUMP	0.1350E 03	PART. FINAL, GAL	0.1865E 05
P.P. EXIT	0.1290E 03	FBA SUMP	0.0	PART. TIME, MIN	0.1850E 02
PART. CYC. SUMP	0.1320E 03	MGO SLAK TANK	0.0	ABS H2O IN. GAL	0.4011E 04
ABS CYC. SUMP	0.1300E 03	MGOH2 TANK	0.8800E 02	ABS H2O FI. GAL	0.4024E 04
FBA SUMP	0.6000E 02			ABS H2O TIME, MIN	0.1850E 02
MGO SLAK TANK	0.7600E 02			MGO ROTO. SCALE, %	0.3000E 02
MGOH2 TANK	0.8500E 02			MAKEUP SETTING	0.3000E 02
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-018

DATE 12-15-69

TIME OF DAY 1550

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	118.0					0.006	48.9	487.	23.0
SECONDARY AIR	4953.	640.8					0.004	39.0	4932.	10.6
FURNACE EXIT	5896.	520.0	3104.2		1122.	2.6291	0.048	110.8	5624.	4.2
PART.SCRB.INLET	5896.	485.0					0.048	110.8		2.7
PART.CYC.EXIT	5939.	138.0	3073.7		1077.	0.0305	0.113	136.7	5336.	-10.8
VENT ABS.INLET	5939.	138.0					0.113	136.7		-15.6
ABS CYC.EXIT	6067.	136.0					0.107	133.6		-24.4
FLOATING BED IN										
FLOATING BED EX										
P.P. EXIT ORIF.	6067.	129.0	637.3				0.107	133.6	5482.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	2.86		60.0	5.9
MAKEUP WATER	138.0	2.77	MAKEUP MGO SL.	85.0	4.0
PRODUCT LIQ.	138.0	23.76	PRODUCT LIQ.	135.0	10.5
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	135.0	378.0
			REC.(FLOW NOZ.)		335.4

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.599E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	476.2
NAT.GAS FLOW,#/HR	8.7
% EXCESS AIR	12.4
OXYGEN,% DRY, MEAS.	2.60
CO2,% DRY-CALC.	15.83
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	0.98
FLYASH COL.EFF	98.84
SO3 ABSORB.EFF	
NOX ABSORB.EFF	4.05
GAS VELOCITY,FPS	161.9
LIQ/GAS,GAL/MCF	14.8
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.3

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	103.5
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	3.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0070
MOL% TOTAL SULF=	1.04
O2 AT FURN.EX.=	2.60
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-018

DATE 12-15-69

TIME OF DAY 1550

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR
17.62
18.17

MAGNESIUM

FLYASH
35.24
24.66

WATER
253.3
272.1

DRY GAS
5614.
5624.

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SULFUR
18.17
17.07

MAGNESIUM

FLYASH
24.66

WATER
1706.
1987.

DRY GAS
5624.
5336.

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

SULFUR
17.07
18.08

MAGNESIUM
11.23
11.50

FLYASH
0.27

WATER
1179.
1212.

DRY GAS
5336.
5482.

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML
4.55
4.55
0.0
4.55

0.28
0.04
4.87

GM-MOLE/
LITER
0.7116
0.7116
0.0
0.7116

0.0430
0.0070
0.7616

GRAM/
100ML

0.172
0.084

10.381

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.489705
HYDROGEN 0.529860
OXYGEN 1.391695
NITROGEN 5.035142
SULFUR 0.009326

FEED RATE, #/SEC = 1.64

ENTHALPY, BTU/# = -67.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.70
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.30
SP. GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 3.20
FLYASH CONC. GM/100ML = *****

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-019	CARD NUMBER	2	CARD NUMBER	3
DATE	12-15-69	WINDBOX ST,H2O	0.1100E 02	N.G. FLOW,%SCALE	0.9650E 02
TIME	1720	BURNER DP,H2O	0.6900E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.4200E 01	SCREW SPEED,RPM	0.3750E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	D2 FURN.EX.%-BM	0.2600E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3900E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2891E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.4800E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1420E 03
ABS LOAD,PSIG	0.5600E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.5900E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.8200E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6800E 03	PRI.AIR FAN IN.	0.7900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5150E 03	PRI.AIR WGT BULB	0.5650E 02
MODE OF OPER.	2	FURN. EXIT	0.1180E 03	SEC.AIR FAN IN.	0.2900E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR		SEC.AIR WET BULB	0.2900E 02
PART.SCR.DP,H2O	0.6300E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5800E 01	VENT.ABS.DP,H2O	0.1600E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H2O	0.5700E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4800E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1340E 03	TEMP.THERMOMETERS,F	0.1380E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1350E 03	PART.INIT.GAL	0.1887E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1360E 03	PART.FINAL,GAL	0.1889E 05
FBA EXIT	0.1280E 03	PART.CYC.SUMP	0.1310E 03	PART.TIME,MIN	0.1000E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.4075E 04
PART.CYC.SUMP	0.1280E 03	FBA SUMP	0.7200E 02	ABS H2O FI.GAL	0.4086E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.9000E 02	ABS H2O TIME,MIN	0.1000E 02
MGO SUMP	0.7700E 02	MGOH2 TANK	0.6000E 02	MGO ROTO.SCALE,%	0.2800E 02
MGO SLAK TANK	0.9000E 02			MAKEUP SETTING	0.2800E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-019

DATE 12-15-69

TIME OF DAY 1720

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	491.	118.0	---	---	---	---	0.005	45.3	488.	23.0
SECONDARY AIR	4971.	641.3	---	---	---	---	0.004	36.0	4951.	11.0
FURNACE EXIT	5915.	515.0	2958.9	---	---	---	0.048	110.5	5645.	3.9
PART-SCRB.INLET	5915.	480.0	---	---	---	---	0.048	110.5	---	2.7
PART.CYC.EXIT	5949.	138.0	2997.8	---	1129.	0.0308	0.109	135.7	5364.	-10.8
VENT ABS.INLET	5949.	138.0	---	---	---	---	0.109	135.7	---	-15.6
ABS CYC.EXIT	6026.	135.0	---	---	---	---	0.102	132.0	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6026.	128.0	556.9	906.	---	---	0.102	132.0	5470.	-24.4

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	2.30	MAKEUP WATER	TEMP, F FLOW, #/M	TEMP, F FLOW, #/M
PRODUCT LIQ.	136.0	2.77	MAKEUP MGO SL.	60.0 9.6	*****
RECIRCULATED LIQ.	136.0	23.76	PRODUCT LIQ.	90.0 3.9	*****
			REC. (SPRAY NOZ.)	131.0 13.9	*****
			REC. (FLOW NOZ.)	131.0 604.3	*****
				505.2	*****

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.601E 07
% FUEL AS COAL	96.8
COAL FLOW RATE, #/HR	478.1
NAT. GAS FLOW, #/HR	8.8
% EXCESS AIR	12.4
OXYGEN, % DRY, MEAS.	2.60
CO2, % DRY-CALC.	15.83
HUMIDITY, #/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-1.32
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY, FPS	161.6
LIQ/GAS, GAL/MCF	14.8
LIQ/GAS, #/#	2.0
PRES.DROP, IN.WG	6.3

VENT ABS.

81.42

19.71
79.5
36.3
5.0
1.6

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 110.5
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME, MIN = 2.4

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2 = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME, MIN = *****

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L = 0.0167
 MOL% TOTAL SULF = 2.73
 O2 AT FURN. EX. = 2.60
 O2 AT ABSORB.IN = *****
 O2 AT ABSORB.EX = *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-019

DATE 12-15-69

TIME OF DAY 1720

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	17.69			35.38	251.5	5635.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	17.38			*****	270.3	5645.	CARBON 0.489720
PART.SCRUBBER							HYDROGEN 0.521789
INPUT, #/HR	17.38			*****	1421.	5645.	OXYGEN 1.391697
OUTPUT, #/HR	16.73			*****	1969.	5364.	NITROGEN 5.035127
SO2 ABSORBERS							SULFUR 0.009327
INPUT, #/HR	16.73		10.96	0.28	1377.	5364.	FEED RATE, #/SEC= 1.65
OUTPUT, #/HR	20.18		12.58	*****	1385.	5470.	ENTHALPY, BTU/# = 205.

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	3.99	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	3.92	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = 7.80
FREE	0.06				MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	3.86				% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	*****				PRODUCT MG BASE PHYSICAL PROPERTIES
MONO(SOLID)	*****				ACID STRENGTH, PH = 7.60
BISULFITE	*****				SP.GRAVITY, HYDROM. = *****
MGO	0.0				
SULFATE	0.11				
MAGNESIUM	4.03				
FLYASH					
SOLIDS, MG					

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 3.20
FLYASH CONC. GM/100ML = *****

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-020	CARD NUMBER	2	CARD NUMBER	3
DATE	12-17-69	WINDBOX ST,H20	0.1180E 02	N.G. FLOW,%SCALE	0.9500E 02
TIME	1100	BURNER DP,H20	0.7000E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H20	0.5200E 01	SCREEN SPEED,RPM	0.3500E 03
PRI.AIR DP,H20	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.2700E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H20	0.4600E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.1200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2920E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.4200E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.5750E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6300E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7000E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.5800E 03	PRI.AIR FAN IN.	0.7600E 02
		NO.2 BANK OUT	0.4400E 03	PRI.AIR WGT BULB	0.5350E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H20	0.5000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H20	0.5300E 01	VENT.ABS.DP,H20	0.1400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H20	0.5500E 01	FBA SUMP DP,H20	0.0
#1 ORIF.DP,H20	0.4300E 01			FBA DP,H20	0.0
				FBA DEMIST.DP,H20	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1250E 03	PART.CYC.EXIT	0.1320E 03	PART.INIT.GAL	0.1975E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1240E 03	PART.FINAL,GAL	0.1996E 05
FBA EXIT	0.6000E 02	PART.CYC.SUMP	0.1250E 03	PART.TIME,MIN	0.3000E 02
P.P.EXIT	0.1160E 03	ABS CYC.SUMP	0.1200E 03	ABS H2O IN.GAL	0.4305E 04
PART.CYC.SUMP	0.1180E 03	FBA SUMP	0.6000E 02	ABS H2O FI.GAL	0.4344E 04
ABS CYC.SUMP	0.1180E 03	MGO SLAK TANK	0.6000E 02	ABS H2O TIME,MIN	0.3000E 02
FBA SUMP	0.6000E 02	MGOH2 TANK	0.7000E 02	MGO ROTO.SCALE,%	0.1800E 02
MGO SLAK TANK	0.7300E 02			MAKEUP SETTING	0.1800E 02
MGOH2 TANK	0.6700E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-020

DATE 12-17-69

TIME OF DAY 1100

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	508.	110.0	---	---	---	---	0.004	39.5	505.	23.0
SECONDARY AIR	4971.	642.5	---	---	---	---	0.004	39.0	4950.	11.8
FURNACE EXIT	5931.	440.0	2845.5	3.8	---	1.5974	0.048	110.6	5660.	1.2
PART.SCRB.INLET	5931.	420.0	-----	-----	-----	-----	0.048	110.6	---	0.0
PART.CYC.EXIT	5731.	132.0	2861.2	-----	-----	0.0211	0.082	126.7	5299.	-10.8
VENT ABS.INLET	5731.	132.0	-----	-----	-----	-----	0.082	126.7	---	-15.1
ABS CYC.EXIT	5913.	124.0	-----	-----	-----	-----	0.076	123.0	---	-24.4
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	5913.	116.0	621.6	-----	-----	-----	0.076	123.0	5497.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	6.77	---	60.0	---
MAKEUP WATER	125.0	6.71	MAKEUP MGO SL.	67.0	---
PRODUCT LIQ.	125.0	23.76	PRODUCT LIQ.	120.0	---
RECIRCULATED LIQ.	---	---	REC.(SPRAY NOZ)	120.0	---
---	---	---	REC.(FLOW NOZ.)	522.1	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.600E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	477.0
NAT.GAS FLOW,#/HR	8.7
% EXCESS AIR	12.9
OXYGEN,%DRY,MEAS.	2.70
CO2,%DRY-CALC.	15.75
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-0.55
FLYASH COL.EFF	98.68
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	150.3
LIQ/GAS,GAL/MCF	15.9
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.0

VENT ABS.

78.27

74.6
39.9
5.3
1.4

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 100.7
 SULFITE/SO2-MOL/MOL = -----
 SUMP RESID.TIME,MIN = 2.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = -----
 SULFITE/SO2-MOL/MOL = -----
 SUMP RESID.TIME,MIN = -----

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0180
 MOL% TOTAL SULF= 3.58
 O2 AT FURN.EX.= 2.70
 O2 AT ABSORB.IN= -----
 O2 AT ABSORB.EX= -----

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-020 DATE 12-17-69 TIME OF DAY 1100

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.487380
HYDROGEN	0.508081
OXYGEN	1.391984
NITROGEN	5.037277
SULFUR	0.009284

FEED RATE, #/SEC = 1.65

ENTHALPY, BTU/# = 95.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	17.65	---	35.30	252.6	5650.
OUTPUT, #/HR	16.77	---	15.09	271.2	5660.

PART. SCRUBBER

INPUT, #/HR	16.77	---	15.09	3657.	5660.
OUTPUT, #/HR	15.78	---	*****	3788.	5299.

SO2 ABSORBERS

INPUT, #/HR	15.78	8.77	0.19	1258.	5299.
OUTPUT, #/HR	17.43	8.99	*****	1257.	5497.

* SO2 ABSORBERS-PRODUCT COMP.

	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
TOTAL,	3.18	0.4964	---
COMBINED	2.73	0.4259	---
FREE	0.45	0.0705	---
MONO(TOTAL)	2.28	0.3555	---
MONO(DISSOLVED)	*****	*****	*****
MONO(SOLID)	*****	*****	*****
BISULFITE	*****	*****	*****
MGO	0.0	0.0	0.0
SULFATE	0.11	0.0180	0.216
MAGNESIUM	2.84	0.4439	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	4.285

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.70

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.20

SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 3.10

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-021	CARD NUMBER	2	CARD NUMBER	3
DATE	12-17-69	WINDBOX ST,H2O	0.1480E 02	N.G. FLOW,%SCALE	0.9450E 02
TIME	1345	BURNER DP,H2O	0.7200E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.7500E 01	SCREW SPEED,RPM	0.3500E 03
PRI.AIR DP,H2O	0.2000E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX,%-BM	0.2800E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.4500E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	-0.6500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2920E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.9500E 02	PART.SCRUB.IN	0.4100E 03
ABS NOZ.,PSIG	0.1300E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1380E 03
ABS LOAD,PSIG	0.1100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.3200E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.5500E 03	PRI.AIR FAN IN.	0.7850E 02
		NO.2 BANK OUT	0.4800E 03	PRI.AIR WGT BULB	0.5450E 02
CARD NUMBER	7	FURN. EXIT	0.3700E 03	SEC.AIR FAN IN.	0.3300E 02
MODE OF OPER.	2	COAL-AIR	0.0	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	-0.4500E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.5000E 01	VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.5300E 01	ABS CYC.DP,H2O	0.4300E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.1200E 01			FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4300E 01			FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1250E 03	PART.CYC.EXIT	0.1300E 03	PART.INIT.GAL	0.2074E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1220E 03	PART.FINAL,GAL	0.2079E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1230E 03	PART.TIME,MIN	0.7000E 01
P.P.EXIT	0.1180E 03	ABS CYC.SUMP	0.1170E 03	ABS H2O IN.GAL	0.4467E 04
PART.CYC.SUMP	0.1190E 03	FBA SUMP	0.0	ABS H2O FI.GAL.	0.4479E 04
ABS CYC.SUMP	0.1180E 03	MGO SLAK TANK	0.7800E 02	ABS H2O TIME,MIN	0.8000E 01
FBA SUMP	0.0	MGOH2 TANK	0.7600E 02	MGO ROTO.SCALE,%	0.1800E 02
MGO SLAK TANK	0.7700E 02			MAKEUP SETTING	0.1800E 02
MGOH2 TANK	0.7300E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-021

DATE 12-17-69

TIME OF DAY 1345

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	516.	0.0	---	---	---	---	0.004	39.6	514.	23.0
SECONDARY AIR	4971.	642.5	---	---	---	---	0.004	37.7	4951.	14.8
FURNACE EXIT	5938.	370.0	3223.8	---	---	---	0.048	109.6	5669.	-6.5
PART.SCRB.INLET	5938.	410.0	---	---	---	---	0.048	109.6	---	-6.1
PART.CYC.EXIT	5707.	130.0	3186.4	---	---	0.0252	0.077	124.4	5297.	-16.3
VENT ABS.INLET	5707.	130.0	---	---	---	---	0.077	124.4	---	-20.6
ABS CYC.EXIT	5837.	122.0	---	---	---	---	0.076	123.0	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5837.	118.0	762.5	*****	*****	*****	0.076	123.0	5426.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	6.36	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	123.0	6.83	MAKEUP MGO SL.	60.0 12.5	*****
PRODUCT LIQ.	123.0	23.76	PRODUCT LIQ.	73.0 3.2	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	117.0 11.7	*****
			REC.(FLOW NOZ.)	378.0 372.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.598E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	475.3
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	13.3
OXYGEN,%DRY,MEAS.	2.80
CO2,%DRY-CALC.	15.66
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.16
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	151.0
LIQ/GAS,GAL/MCF	15.9
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.0

VENT ABS.

76.07

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	93.2
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	2.9

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0135
MOL% TOTAL SULF=	2.72
O2 AT FURN.EX.=	2.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-021

DATE 12-17-69

TIME OF DAY 1345

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

DRY GAS

WATER

FLYASH

MAGNESIUM

SULFUR

FURNACE

INPUT, #/HR

OUTPUT, #/HR

PART. SCRUBBER

INPUT, #/HR

OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR

OUTPUT, #/HR

*

*SO2 ABSORBERS-
PRODUCT COMP.

GRAM/
100ML

GM-MOLE/
LITER

GM SO2/
100ML

TOTAL,

COMBINED

FREE

MONO(TOTAL)

MONO(DISSOLVED)

MONO(SOLID)

BISULFITE

MGO

SULFATE

MAGNESIUM

FLYASH

SOLIDS, MG

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.70

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.40

SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 3.00

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = -11.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.484999

HYDROGEN 0.505974

OXYGEN 1.392269

NITROGEN 5.039468

SULFUR 0.009239

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-022	CARD NUMBER	2	CARD NUMBER	3
DATE	12-18-69	WINDBOX ST, H2O	0.1100E 02	N.G. FLOW, %SCALE	0.9400E 02
TIME	1430	BURNER DP, H2O	0.6600E 01	N.G. STATIC, R.O.	0.8800E 01
PRI. AIR ST, HG	0.1700E 01	FURN. ST, H2O	0.4600E 01	SCREW SPEED, RPM	0.3750E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1800E 01	D2 FURN. EX. % - BM	0.2400E 01
SEC. AIR ST, HG	0.1700E 01	PP EXIT DP, H2O	0.4800E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.4800E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2885E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4400E 02	SEC. AIR ORIF.	0.9000E 02	PART. SCRUB. IN	0.4100E 03
ABS NOZ., PSIG	0.1300E 02	WINDBOX-TOP	0.6650E 03	#1 ORIFICE	0.1390E 03
ABS LOAD, PSIG	0.1200E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF. INCH	0.3200E 01	WINDBOX-BOT.	0.6550E 03	AIR HEATER #1	0.7050E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6450E 03	PRI. AIR FAN IN.	0.7600E 02
		NO. 2 BANK OUT	0.5700E 03	PRI. AIR WGT BULB	0.5500E 02
CARD NUMBER	7	FURN. EXIT	0.4550E 03	SEC. AIR FAN IN.	0.3200E 02
MODE OF OPER.	2	COAL-AIR	0.1050E 03	SEC. AIR WET BULB	0.3200E 02
PART. SCR. ST, HG	0.3000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.5500E 01	VENT. ABS. DP, H2O	0.1400E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.5500E 01	ABS CYC. DP, H2O	0.4700E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. ST, HG	-0.5000E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.3500E 01			FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1270E 03	PART. CYC. EXIT	0.1310E 03	PART. INIT. GAL	0.2277E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1260E 03	PART. FINAL, GAL	0.2286E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1260E 03	PART. TIME, MIN	0.1400E 02
P. P. EXIT	0.1210E 03	ABS CYC. SUMP	0.1260E 03	ABS H2O IN. GAL	0.4951E 04
PART. CYC. SUMP	0.1210E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.4963E 04
ABS CYC. SUMP	0.1210E 03	MGO SLAK TANK	0.1880E 03	ABS H2O TIME, MIN	0.1300E 02
FBA SUMP	0.0	MGOH2 TANK	0.8900E 02	MGO ROTO. SCALE, %	0.3200E 02
MGO SLAK TANK	0.1860E 03			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.8600E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-022

DATE 12-18-69

TIME OF DAY 1430

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	507.	105.0					0.005	44.3	504.	23.0
SECONDARY AIR	4965.	652.5					0.004	39.0	4944.	11.0
FURNACE EXIT	5931.	455.0	2914.9	1.0		3.5799	0.049	111.0	5656.	4.8
PART.SCRB.INLET	5931.	410.0					0.049	111.0		4.1
PART.CYC.EXIT	5178.	131.0	2923.6				0.078	125.3	4802.	-6.8
VENT ABS.INLET	5178.	131.0					0.078	125.3		-10.3
ABS CYC.EXIT	5988.	126.0					0.070	120.0		-24.4
FLOATING BED IN										
FLOATING BED EX										
P.P. EXIT ORIF.	5988.	121.0	660.2				0.070	120.0	5596.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	6.46	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	126.0	6.71	MAKEUP MGO SL.	60.0 8.0	*****
PRODUCT LIQ.	126.0	23.76	PRODUCT LIQ.	86.0 4.2	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	126.0 14.0	*****
			REC.(FLOW NOZ.)	126.0 378.0	*****
				372.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.608E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	484.4
NAT.GAS FLOW,#/HR	8.5
% EXCESS AIR	11.4
OXYGEN,% DRY, MEAS.	2.40
CO2,% DRY-CALC.	16.01
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-0.30
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	135.4
LIQ/GAS,GAL/MCF	17.7
LIQ/GAS,#/#	2.3
PRES.DROP,IN.WG	5.5

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	99.9
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	2.4

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0177
MOL% TOTAL SULF=	3.66
O2 AT FURN.EX.=	2.40
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-022 DATE 12-18-69 TIME OF DAY 1430

MATERIAL BALANCES

		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS		
FURNACE							INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	17.92	-----		35.85	256.9	5646.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	17.15	-----		33.75	275.2	5656.	CARBON 0.494697	
PART. SCRUBBER							HYDROGEN 0.523411	
INPUT, #/HR	17.15	-----		33.75	3510.	5656.	OXYGEN 1.391147	
OUTPUT, #/HR	14.60	-----		*****	3732.	4802.	NITROGEN 5.030538	
SO2 ABSORBERS							SULFUR 0.009429	
INPUT, #/HR	14.60		11.03	*****			FEED RATE, #/SEC= 1.65	
OUTPUT, #/HR	16.96		10.36	*****			ENTHALPY, BTU/# = 70.	

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
--	------------------	-------------------	----------------	------------------------

TOTAL, 3.01 0.4696 0.4696 SLURRY CONC.- GM MGO/100ML = 7.30

COMBINED 3.01 0.4696 MGO PRESLAKED, NO=0, YES=1 0

FREE 0.0 0.0 0.0 % SLAKED TO MG(OH)2, MEAS. = *****

MONO(TOTAL) 3.01 0.4696 PRODUCT MG BASE PHYSICAL PROPERTIES

MONO(DISSOLVED) ***** ACID STRENGTH, PH = 7.50

MONO(SOLID) ***** SP.GRAVITY, HYDROM. = 1.0300

BISULFITE *****

MGO 0.16 0.0252 0.101

SULFATE 0.11 0.0177 0.212

MAGNESIUM 3.28 0.5125

FLYASH -----

SOLIDS, MG ----- 1.575

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 3.50
FLYASH CONC. GM/100ML = 0.51

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-023	CARD NUMBER	2	CARD NUMBER	3
DATE	12-18-69	WINDBOX ST,H20	0.1110E 02	N.G. FLOW,%SCALE	0.9400E 02
TIME	1600	BURNER DP,H20	0.7000E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H20	0.4300E 01	SCREW SPEED,RPM	0.3750E 03
PRI.AIR DP,H20	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.2600E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H20	0.4700E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.5300E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2878E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.9000E 02	PART.SCRUB.IN	0.4050E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1380E 03
ABS LOAD,PSIG	0.6000E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6100E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6550E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6600E 03	PRI.AIR FAN IN.	0.7600E 02
		NO.2 BANK OUT	0.5800E 03	PRI.AIR WGT BULB	0.5500E 02
CARD NUMBER	7	FURN. EXIT	0.4500E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	2	COAL-AIR	0.1020E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.3000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H20	0.5400E 01	VENT.ABS.DP,H20	0.1500E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H20	0.5400E 01	ABS CYC.DP,H20	0.5200E 01	FBA SUMP DP,H20	0.0
#1 ORIF.ST,HG	-0.5000E 00			FBA DP,H20	0.0
#1 ORIF.DP,H20	0.4400E 01			FBA DEMIST.DP,H20	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1265E 03	PART.CYC.EXIT	0.1290E 03	PART.INIT.GAL	0.2336E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1260E 03	PART.FINAL,GAL	0.2347E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1250E 03	PART.TIME,MIN	0.1700E 02
P.P.EXIT	0.1210E 03	ABS CYC.SUMP	0.1250E 03	ABS H2O IN.GAL	0.5037E 04
PART.CYC.SUMP	0.1210E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.5050E 04
ABS CYC.SUMP	0.1210E 03	MGO SLAK TANK	0.1780E 03	ABS H2O TIME,MIN	0.1700E 02
FBA SUMP	0.0	MGOH2 TANK	0.8800E 02	MGO ROTO.SCALE,%	0.3300E 02
MGO SLAK TANK	0.1760E 03			MAKEUP SETTING	0.3300E 02
MGOH2 TANK	0.8600E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-023

DATE 12-18-69

TIME OF DAY 1600

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	497.	102.0	---	---	---	---	0.005	44.3	494.	23.0
SECONDARY AIR	4959.	647.5	---	---	---	---	0.004	39.0	4938.	11.1
FURNACE EXIT	5910.	450.0	2999.9	---	---	---	0.048	110.7	5638.	5.3
PART.SCRB.INLET	5910.	405.0	-----	1.2	-----	17.5586	0.048	110.7	---	4.1
PART.CYC.EXIT	5809.	129.0	-----	-----	-----	-----	0.077	124.7	5393.	-6.8
VENT ABS.INLET	5809.	129.0	-----	-----	-----	-----	0.077	124.7	---	-11.2
ABS CYC.EXIT	5919.	126.0	-----	-----	-----	-----	0.069	119.2	---	-24.4
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	5919.	121.0	580.9	-----	-----	-----	0.069	119.2	5539.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	VENTURI ABSORBER	FBA
PARTICULATE	60.0	6.35	MAKEUP WATER	60.0	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	125.0	6.71	MAKEUP MGO SL.	66.0	6.1	6.1
PRODUCT LIQ.	125.0	23.76	PRODUCT LIQ.	125.0	4.3	4.3
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	125.0	14.0	14.0
			REC.(FLOW NOZ.)	604.3	513.7	513.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.600E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	477.8
NAT.GAS FLOW,#/HR	8.5
% EXCESS AIR	12.4
OXYGEN,%DRY,MEAS.	2.60
CO2,%DRY-CALC.	15.84
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

	PART.	VENT ABS.	FLOAT.BED
SO2 ABSORB.EFF	1.66	80.31	-----
FLYASH COL.EFF	-----	-----	-----
SO3 ABSORB.EFF	-----	-----	-----
NOX ABSORB.EFF	-----	-----	-----
GAS VELOCITY,FPS	151.8	75.8	-----
LIQ/GAS,GAL/MCF	15.8	38.7	-----
LIQ/GAS,#/#	2.0	5.2	-----
PRES.DROP,IN.WG	5.4	1.5	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 108.0
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = 2.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0198
 MOL% TOTAL SULF= 3.90
 O2 AT FURN.EX.= 2.60
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-023

DATE 12-18-69

TIME OF DAY 1600

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.489863
HYDROGEN 0.519437
OXYGEN 1.391708
NITROGEN 5.034987
SULFUR 0.009335

FEED RATE, #/SEC= 1.64

ENTHALPY, BTU/# = 83.

WATER

253.7
272.0

FLYASH

35.36
165.11

MAGNESIUM

SULFUR

17.68
17.60

PART.SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

17.60
16.56

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

16.56
17.20

* SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

TOTAL, 3.17
COMBINED 3.17
FREE 0.0
MONO(TOTAL) 3.17
MONO(DISSOLVED) *****
MONO(SOLID) *****
BISULFITE *****
MGO 0.0
SULFATE 0.13
MAGNESIUM 3.29
FLYASH -----
SOLIDS, MG -----

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.00
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.40
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 3.40
FLYASH CONC. GM/100ML = 0.07

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-024	CARD NUMBER	2	CARD NUMBER	3
DATE	12-19-69	WINDBOX ST,H20	0.9100E 01	N.G. FLOW,SCALE	0.9700E 02
TIME	1000	BURNER DP,H20	0.6200E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H20	0.2800E 01	SCREW SPEED,RPM	0.3750E 03
PRI.AIR DP,H20	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	D2 FURN.EX,8-BM	0.2500E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H20	0.4700E 01	COMB.FURN,EX,8	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX,ST,H20	0.3500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2894E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.9200E 02	PART.SCRUB.IN	0.4250E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.6580E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.6000E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6200E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6820E 03	PRI.AIR FAN IN.	0.7800E 02
		NO.2 BANK OUT	0.6000E 03	PRI.AIR WGT BULB	0.5650E 02
CARD NUMBER	7	FURN. EXIT	0.4650E 03	SEC.AIR FAN IN.	0.3300E 02
MODE OF OPER.	2	COAL-AIR	0.1180E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H20	0.5600E 01	VENT.ABS.DP,H20	0.1500E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H20	0.5600E 01	ABS CYC.DP,H20	0.6200E 01	FBA SUMP DP,H20	0.0
#1 ORIF.ST,HG	-0.7000E 00			FBA DP,H20	0.0
#1 ORIF.DP,H20	0.4500E 01			FBA DEMIST.DP,H20	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1270E 03	PART.CYC.EXIT	0.1320E 03	PART.INIT.GAL	0.2462E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1260E 03	PART.FINAL,GAL	0.2470E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1260E 03	PART.TIME,MIN	0.1500E 02
P.P.EXIT	0.1200E 03	ABS CYC.SUMP	0.1240E 03	ABS H20 IN.GAL	0.5321E 04
PART.CYC.SUMP	0.1210E 03	FBA SUMP	0.0	ABS H20 FI.GAL	0.5333E 04
ABS CYC.SUMP	0.1210E 03	MGO SLAK TANK	0.7600E 02	ABS H20 TIME,MIN	0.1500E 02
FBA SUMP	0.0	MGOH2 TANK	0.1120E 03	MGO ROTO.SCALE,8	0.1850E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.1850E 02
MGOH2 TANK	0.1180E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-024

DATE 12-19-69

TIME OF DAY 1000

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	502.	118.0	---	---	---	---	0.006	46.3	499.	23.0
SECONDARY AIR	4964.	643.3	---	---	---	---	0.004	37.8	4943.	9.1
FURNACE EXIT	5922.	465.0	2944.9	---	903.	---	0.048	110.8	5649.	3.5
PART.SCRB.INLET	5922.	425.0	---	---	---	---	0.048	110.8	---	1.4
PART.CYC.EXIT	5857.	132.0	2650.5	---	---	---	0.076	124.4	5441.	-9.5
VENT ABS.INLET	5857.	132.0	---	---	---	---	0.076	124.4	---	-14.0
ABS CYC.EXIT	5941.	126.0	---	---	---	---	0.069	119.7	---	-24.4
FLOATING BED IN	*****	*****	---	---	---	---	*****	*****	---	*****
FLOATING BED EX	*****	*****	---	---	---	---	*****	*****	---	*****
P.P. EXIT ORIF.	5941.	120.0	537.9	---	---	---	0.069	119.7	5556.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.43	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	126.0	6.71	MAKEUP MGO SL.	60.0 6.7	*****
PRODUCT LIQ.	126.0	23.76	PRODUCT LIQ.	118.0 3.2	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	124.0 14.0	*****
			REC.(FLOW NOZ.)	124.0 604.3	*****
				517.9	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.605E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	480.8
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	11.9
OXYGEN,% DRY, MEAS.	2.50
CO2,% DRY-CALC.	15.92
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	10.00
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	153.9
LIQ/GAS,GAL/MCF	15.6
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	5.6

VENT ABS.

79.71

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FT2,	=	106.3	KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****	SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	2.4	SUMP RESID.TIME,MIN	=	*****
***** MEANS ITEM NOT MEASURED					
CONC.,GM-MOLE/L= 0.0266					
MOL% TOTAL SULF= 4.90					
O2 AT FURN.EX.= 2.50					
O2 AT ABSORB.IN= *****					
O2 AT ABSORB.EX= *****					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-024 DATE 12-19-69 TIME OF DAY 1000

MATERIAL BALANCES

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE				
INPUT, #/HR	17.79	35.58	254.2	5639.
OUTPUT, #/HR	17.31	*****	273.2	5649.
PART. SCRUBBER				
INPUT, #/HR	17.31	*****	2992.	5649.
OUTPUT, #/HR	15.00	*****	3772.	5441.
SO2 ABSORBERS				
INPUT, #/HR	15.00	8.87	993.	5441.
OUTPUT, #/HR	17.74	9.91	1223.	5556.

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.492106
HYDROGEN	0.526009
OXYGEN	1.391413
NITROGEN	5.032930
SULFUR	0.009373

FEED RATE, #/SEC = 1.65

ENTHALPY, BTU/# = 34.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/100ML	GRAM/100ML	MAKEUP MGO COMPOSITION
COMBINED	3.31	---	SLURRY CONC.- GM MGO/100ML = 7.70
FREE	2.97	---	MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	0.34	---	% SLAKED TO MG(OH)2, MEAS. = 93.00
MONO(DISSOLVED)	2.63	---	
MONO(SOLID)	*****	*****	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	*****	*****	ACID STRENGTH, PH = 7.00
MGO	0.0	0.0	SP.GRAVITY, HYDROM. = 1.0400
SULFATE	0.17	0.319	
MAGNESIUM	3.14	---	PARTICULATE SCRUBBER PRODUCT
FLYASH	---	*****	ACID STRENGTH, PH = 3.50
SOLIDS, MG	---	0.475	FLYASH CONC. GM/100ML = 0.21

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-025				
DATE	12-19-69				
TIME	1130				
PRI-AIR ST, HG	0.1700E 01	WINDBOX ST, H2O	0.9700E 01	CARD NUMBER	2
PRI-AIR DP, H2O	0.2400E 01	BURNER DP, H2O	0.6200E 01	N.G. FLOW, %SCALE	0.9600E 02
SEC-AIR ST, HG	0.1700E 01	FURN. ST, H2O	0.3300E 01	N.G. STATIC, R.O.	0.8800E 01
SEC-AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1800E 01	SCREW SPEED, RPM	0.3800E 03
		PP EXIT DP, H2O	0.4800E 01	O2 FURN-EX, %BM	0.2600E 01
		FURN-EX, ST, H2O	0.2000E 01	COMB. FURN, EX, %	0.0
		PEEPSITE DP, HG	0.0	ELE. CHEM. MILVOLT	0.0
		P. SITE ST, PSIG	0.0	CELL TEMP, F	0.0
				BAROMETRIC, HG	0.2893E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4400E 02	SEC. AIR ORIF.	0.9200E 02	PART. SCRUB. IN	
ABS NOZ., PSIG	0.1300E 02	WINDBOX-TOP	0.6580E 03	#1 ORIFICE	0.4300E 03
ABS LOAD, PSIG	0.1300E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.1400E 03
ABS ORIF. INCH	0.3200E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.0
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6900E 03	PRI-AIR FAN IN.	0.7000E 03
		NO. 2 BANK OUT	0.6050E 03	PRI-AIR WGT BULB	0.8000E 02
CARD NUMBER	7	FURN. EXIT	0.4750E 03	SEC-AIR FAN IN.	0.5700E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC-AIR WET BULB	0.3200E 02
PART. SCR. ST, HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.5700E 01	VENT. ABS. DP, H2O	0.1300E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.5700E 01	ABS CYC. DP, H2O	0.4700E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. ST, HG	-0.8000E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.4500E 01	CARD NUMBER	10	FBA DEMIST. DP, H2O	0.0
		CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1280E 03	TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1350E 03	PART. INIT. GAL	0.2520E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1290E 03	PART. FINAL. GAL	0.2530E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1280E 03	PART. TIME, MIN	0.1600E 02
P. P. EXIT	0.1240E 03	ABS CYC. SUMP	0.1280E 03	ABS H2O IN. GAL	0.5372E 04
PART. CYC. SUMP	0.1250E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.5381E 04
ABS CYC. SUMP	0.1250E 03	MGO SLAK TANK	0.7900E 02	ABS H2O TIME, MIN	0.1500E 02
FBA SUMP	0.0	MGOH2 TANK	0.1080E 03	MGO ROTO. SCALE, %	0.1850E 02
MGO SLAK TANK	0.7900E 02			MAKEUP SETTING	0.1850E 02
MGOH2 TANK	0.1060E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-025

DATE 12-19-69

TIME OF DAY 1130

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	505.	110.0	---	---	---	---	0.006	45.6	502.	23.0
SECONDARY AIR	4963.	643.3	---	---	---	---	0.004	39.0	4941.	9.7
FURNACE EXIT	5922.	475.0	2790.1	---	---	4.1494	0.048	110.6	5649.	2.0
PART.SCRB.INLET	5922.	430.0	-----	-----	-----	-----	0.048	110.6	---	1.4
PART.CYC.EXIT	5823.	135.0	2731.8	-----	925.	-----	0.081	125.9	5389.	-10.8
VENT ABS.INLET	5823.	135.0	-----	-----	-----	-----	0.081	125.9	---	-15.3
ABS CYC.EXIT	5978.	129.0	-----	-----	-----	-----	0.071	120.7	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5978.	124.0	609.0	*****	*****	*****	0.071	120.7	5579.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE				TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	60.0	6.44	MAKEUP WATER	60.0 5.0	*****
PRODUCT LIQ.	128.0	6.71	MAKEUP MGO SL.	106.0 3.2	*****
RECIRCULATED LIQ.	128.0	23.76	PRODUCT LIQ.	128.0 14.0	*****
			REC.(SPRAY NOZ)	128.0 378.0	*****
			REC.(FLOW NOZ.)	372.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.602E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	478.5
NAT.GAS FLOW,#/HR	8.7
% EXCESS AIR	12.4
OXYGEN,% DRY, MEAS.	2.60
CO2,% DRY-CALC.	15.84
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	2.09
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	154.8
LIQ/GAS,GAL/MCF	15.5
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	5.7

VENT ABS.

77.71

Float.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 100.5
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = 2.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 =
 SULFITE/SO2-MOL/MOL =
 SUMP RESID.TIME,MIN =

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.1250
 MOL% TOTAL SULF= 18.96
 O2 AT FURN.EX.= 2.60
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-025

DATE 12-19-69

TIME OF DAY 1130

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	17.70	-----	35.41	254.1	5639.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	16.40	-----	39.10	272.8	5649.	CARBON 0.489752
PART. SCRUBBER						HYDROGEN 0.522371
INPUT, #/HR	16.40	-----	39.10	3494.	5649.	OXYGEN 1.391699
OUTPUT, #/HR	15.32	-----	*****	3790.	5389.	NITROGEN 5.035096
SO2 ABSORBERS						SULFUR 0.009329
INPUT, #/HR	15.32	8.87	*****	912.	5389.	FEED RATE, #/SEC= 1.65
OUTPUT, #/HR	21.73	13.47	*****	1227.	5579.	ENTHALPY, BTU/# = -19.

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE			
MONO(TOTAL)	3.53	0.5511	-----
MONO(DISSOLVED)	3.47	0.5415	-----
MONO(SOLID)	0.06	0.0096	-----
BISULFITE	3.40	0.5319	-----
MGO	*****	*****	*****
SULFATE	0.0	0.0	0.0
MAGNESIUM	0.80	0.1250	1.500
FLYASH	4.27	0.6665	-----
SOLIDS, MG	-----	-----	*****
			4.377

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 7.70
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = 93.00

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.10
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 3.50
FLYASH CONC. GM/100ML = 0.06

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-026	CARD NUMBER	2	CARD NUMBER	3
DATE	12-19-69	WINDBOX ST,H2O	0.9200E 01	N.G. FLOW,%SCALE	0.9550E 02
TIME	1400	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.3100E 01	SCREW SPEED,RPM	0.3800E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.2700E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2600E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2890E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9200E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.6580E 03	PART.SCRUB.IN	0.4400E 03
ABS NOZ.,PSIG	0.1300E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.1300E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.3100E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7020E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6200E 03	PRI.AIR FAN IN.	0.8000E 02
		NO.2 BANK OUT	0.4800E 03	PRI.AIR WGT BULB	0.5800E 02
CARD NUMBER	7	FURN. EXIT	0.1180E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.5800E 01				
PART.CYC.DP,H2O	0.5700E 01				
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4400E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1300E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.4700E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1280E 03	TEMP.THERMOMETERS,F	0.1320E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1290E 03	PART.INIT.GAL	0.2620E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1290E 03	PART.FINAL,GAL	0.2626E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1290E 03	PART.TIME,MIN	0.8000E 01
P.P.EXIT	0.1230E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.5450E 04
PART.CYC.SUMP	0.1250E 03	FBA SUMP	0.7800E 02	ABS H2O FI.GAL	0.5457E 04
ABS CYC.SUMP	0.1240E 03	MGO SLAK TANK	0.1030E 03	ABS H2O TIME,MIN	0.8000E 01
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO.SCALE,%	0.3000E 02
MGO SLAK TANK	0.7900E 02			MAKEUP SETTING	0.3000E 02
MGOH2 TANK	0.1020E 03				
MAKEUP WATER	0.6000E 02				

RUN NUMBER C-026

FLUE GAS DATA

	#/HR	F	SU2 PPM	SU3 PPM	NDX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H ₂ O
PRIMARY AIR	501.	118.0					0.006	48.3	498.	
SECONDARY AIR	4960.	642.0					0.004	39.0	4939.	23.0
FURNACE EXIT	5913.	480.0	2935.2	*****	*****	*****	0.048	110.5	5641.	9.2
PART.SCRB.INLET	5913.	440.0	*****	*****	*****	*****	0.048	110.5	---	2.6
PART.CYC.EXIT	5765.	132.0	2671.2	*****	*****	*****	0.089	129.2	---	2.7
VENT ABS.INLET	5765.	132.0	*****	*****	*****	*****	0.089	129.2	---	-9.5
ABS CYC.EXIT	5963.	129.0	*****	*****	*****	*****	0.081	124.5	---	-13.9
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	-24.4
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5963.	123.0	607.0	*****	881.	*****	0.081	124.5	---	*****
RUBBER STREAM DATA				*****		*****			5518.	-24.4

SCRUBBER STREAM DATA

[illegible]

SO₂ ABSORPTION PARAMETERS VENTURI ABSORBER

```

VENTURI ABSORBER
KGA, #MOLE/HR-FT2,      = 98.2
SULFITE/SO2-MOL/MOL     = *****
SUMP RESID.TIME,MIN     = 2.4
***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER
KGA, #MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME,MIN

=
=
=

*****
*****
*****

SULFATE FORMATION PARAMETERS
CONC.,GM-MOLE/L=      0.1240
MOL% TOTAL SULF=      16.00
O2 AT FURN. EX.=      2.70
O2 AT ABSORB.IN=      *****
O2 AT ABSORB.EX=      *****

```


MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-026 DATE 12-19-69 TIME OF DAY 1400

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR
17.59
17.24

MAGNESIUM

FLYASH
35.18

WATER
252.8
271.5

DRY GAS
5631.
5641.

PART.SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

17.24
14.73

4150.
3826.

5641.
5295.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

14.73
25.31

1133.
1270.

5295.
5518.

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GRAM/
100ML

GM-MOLE/
LITER

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.70
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = 93.00

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

4.40
4.40
0.0
4.40

0.57
0.79
5.75

0.6869
0.6869
0.0
0.6869

0.0883
0.1240
0.8992

0.353
1.487

8.440

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 8.20
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 3.20
FLYASH CONC. GM/100ML = 0.12

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

FEED RATE, #/SEC = 1.64

ENTHALPY, BTU/# = 8.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	C-027	CARD NUMBER	2	CARD NUMBER	3
DATE	12-19-69	WINDBOX ST,H2O	0.1000E 02	N.G. FLOW,%SCALE	0.9550E 02
TIME	1515	BURNER DP,H2O	0.6200E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.3700E 01	SCREW SPEED,RPM	0.3800E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX.%-BM	0.2600E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3100E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2891E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.9000E 02	PART.SCRUB.IN	0.4450E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.6580E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.6000E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6200E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7150E 03	PRI.AIR FAN IN.	0.7700E 02
		NO.2 BANK OUT	0.6250E 03	PRI.AIR WGT BULB	0.5650E 02
CARD NUMBER	7	FURN. EXIT	0.4850E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	2	COAL-AIR	0.1120E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1500E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.5700E 01	VENT.ABS.DP,H2O	0.1500E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.5600E 01	ABS CYC.DP,H2O	0.4600E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.7000E 00			FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4300E 01			FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1300E 03	PART.CYC.EXIT	0.1320E 03	PART.INIT.GAL	0.2688E 05
FBA INLET	0.6000E 02	ABS CYC.EXIT	0.1280E 03	PART.FINAL,GAL	0.2700E 05
FBA EXIT	0.6000E 02	PART.CYC.SUMP	0.1280E 03	PART.TIME,MIN	0.1900E 02
P.P.EXIT	0.1200E 03	ABS CYC.SUMP	0.1270E 03	ABS H2O IN.GAL	0.5507E 04
PART.CYC.SUMP	0.1220E 03	FBA SUMP	0.6000E 02	ABS H2O FI.GAL	0.5517E 04
ABS CYC.SUMP	0.1220E 03	MGO SLAK TANK	0.8000E 02	ABS H2O TIME,MIN	0.1900E 02
FBA SUMP	0.6000E 02	MGOH2 TANK	0.1010E 03	MGO ROTO.SCALE,%	0.3200E 02
MGO SLAK TANK	0.8000E 02			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER C-027

DATE 12-19-69

TIME OF DAY 1515

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	504.	112.0	---	---	---	---	0.006	47.2	501.	23.0
SECONDARY AIR	4970.	644.5	---	---	---	---	0.004	39.0	4948.	10.0
FURNACE EXIT	5929.	485.0	2756.2	1.2	---	---	0.048	110.7	5656.	3.1
PART.SCRB.INLET	5929.	445.0	---	---	---	---	0.048	110.7	---	2.0
PART.CYC.EXIT	5708.	132.0	2621.0	---	---	---	0.085	127.6	5263.	-9.5
VENT ABS.INLET	5708.	132.0	---	---	---	---	0.085	127.6	---	-13.8
ABS CYC.EXIT	5991.	128.0	---	---	---	---	0.074	122.0	---	-24.4
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	5991.	120.0	433.8	---	---	---	0.074	122.0	5576.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	6.42	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	128.0	6.71	MAKEUP MGD SL.	60.0 4.4	-----
PRODUCT LIQ.	128.0	23.76	PRODUCT LIQ.	80.0 4.2	-----
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	127.0 13.9	-----
			REC.(FLOW NOZ.)	127.0 604.3	-----
				517.9	-----

FURNACE PERFORMANCE
HEAT RELEASE,BTU/HR
% FUEL AS COAL
COAL FLOW RATE,#/HR
NAT.GAS FLOW,#/HR
% EXCESS AIR
OXYGEN,%DRY,MEAS.
CO2,%DRY-CALC.
HUMIDITY,#/# - CALC.

SCRUBBER PERFORMANCE
SO2 ABSORB.EFF
FLYASH COL.EFF
SO3 ABSORB.EFF
NOX ABSORB.EFF
GAS VELOCITY,FPS
LIQ/GAS,GAL/MCF
LIQ/GAS,#/#
PRES.DROP,IN.WG

VENT ABS.
83.45

76.9
38.5
5.2
1.5

FLOAT.BED

SO2 ABSORPTION PARAMETERS
VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FT2, = 120.4
SULFITE/SO2-MOL/MOL = -----
SUMP RESID.TIME,MIN = 2.4

KGA,#MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME,MIN

CONC.,GM-MOLE/L= 0.1318
MOL% TOTAL SULF= 16.85
O2 AT FURN.EX.= 2.60
O2 AT ABSORB.IN= -----
O2 AT ABSORB.EX= -----

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER C-027

DATE 12-19-69

TIME OF DAY 1515

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 17.73
 OUTPUT, #/HR 16.22
 Sulfur 17.73 16.22
 MAGNESIUM 35.46
 FLYASH 5645.
 DRY GAS 5656.
 PART. SCRUBBER
 INPUT, #/HR 16.22
 OUTPUT, #/HR 14.36
 Sulfur 16.22 14.36
 MAGNESIUM 3486.
 FLYASH 3801.
 DRY GAS 5656.
 5263.

SO2 ABSORBERS
 INPUT, #/HR 14.36
 OUTPUT, #/HR 24.48
 Sulfur 14.36 24.48
 MAGNESIUM 10.88
 FLYASH 17.95
 DRY GAS 5263.
 5576.

* SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 4.41
 COMBINED 4.41
 FREE 0.0
 MONO(TOTAL) 4.41
 MONO(DISSOLVED) *****
 MONO(SOLID) *****
 BISULFITE *****
 MGO 0.46
 SULFATE 0.84
 MAGNESIUM 5.71
 FLYASH -----
 SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.489787
 HYDROGEN 0.525688
 OXYGEN 1.391702
 NITROGEN 5.035061
 SULFUR 0.009331

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 1.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.20
 MGO PRESLAKED, NO=0, YES=1 0
 % SLAKED TO MG(OH)2, MEAS. = 93.00

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.50
 SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 3.00
 FLYASH CONC. GM/100ML = 0.05

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-028	CARD NUMBER	2	CARD NUMBER	3
DATE	1-9-70	WINDBOX ST,H2O	0.1300E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	1415	BURNER DP,H2O	0.7000E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1700E 01	FURN. ST,H2O	0.5000E 01	SCREW SPEED,RPM	0.3800E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX,%-BM	0.2400E 01
SEC.AIR ST,HG	0.1800E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2600E 01	FURN.EX,ST,H2O	0.5000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.1400E 03	TEMP.CONTINUED	0.4800E 03
PART.LOAD,PSIG	0.4300E 02	SEC.AIR ORIF.	0.7400E 03	PART.SCRUB.IN	0.1200E 03
ABS NOZ.,PSIG	0.3300E 02	WINDBOX-TOP	0.7000E 03	#1 ORIFICE	0.9000E 02
ABS LOAD,PSIG	0.6200E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.8200E 03
ABS ORIF-INCH	0.1000E 01	WINDBOX-BOT.	0.7250E 03	AIR HEATER #1	0.6900E 03
ABSORBER NOZ. CODE	4	WINDBOX-EAST	0.8200E 03	AIR HEATER #2	0.7000E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.6900E 03	PRI.AIR FAN IN.	0.5100E 02
CARD NUMBER	7	NO.2 BANK OUT	0.0	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	3	FURN. EXIT	0.1200E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.3000E 00	COAL-AIR			
PART.SCR.DP,H2O	0.6800E 01			CARD NUMBER	9
PART.CYC.DP,H2O	0.5400E 01			FBA INLET ST,HG	-0.8000E 00
#1 ORIF.ST,HG	-0.6000E 00			FBA SUMP DP,H2O	0.1000E 01
#1 ORIF.DP,H2O	0.4500E 01			FBA DP,H2O	0.5000E 01
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	8	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1300E 03	VENT.ABS.DP,H2O	0.0	MAKEUP FLOWS	0.2857E 05
#1 ORIFICE	0.1280E 03	ABS CYC.DP,H2O	0.0	PART.INIT.GAL	0.2858E 05
FBA INLET	0.1240E 03	PART.CYC.EXIT	0.1350E 03	PART.FINAL,GAL	0.8000E 00
FBA EXIT	0.1230E 03	ABS CYC.EXIT	0.0	PART.TIME,MIN	0.6015E 04
P.P.EXIT	0.1240E 03	PART.CYC.SUMP	0.1250E 03	ABS H2O IN.GAL	0.6016E 04
PART.CYC.SUMP	0.0	ABS CYC.SUMP	0.6500E 02	ABS H2O FI.GAL	0.2800E 01
ABS CYC.SUMP	0.1230E 03	FBA SUMP	0.6100E 02	MGO ROTO.SCALE,%	0.2800E 02
FBA SUMP	0.1230E 03	MGO SLAK TANK		MAKEUP SETTING	0.2800E 02
MGO SLAK TANK	0.6500E 02	MGOH2 TANK			
MGOH2 TANK	0.6200E 02				
MAKEUP WATER	0.4000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-028

DATE 1-9-70

TIME OF DAY 1415

MATERIAL BALANCES

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR
18.24
16.83

MAGNESIUM

FLYASH
36.48

WATER
260.9
280.0

DRY GAS
5749.
5760.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

16.83
15.29

3407.
3807.

5760.
5391.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

15.29
15.99

8.85
7.07

849.
1187.

5391.
5701.

*
*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 6.30
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.40
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 3.50
FLYASH CONC. GM/100ML = 0.72

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.494578
HYDROGEN 0.514800
OXYGEN 1.391136
NITROGEN 5.030652
SULFUR 0.009423

FEED RATE, #/SEC= 1.68

ENTHALPY, BTU/# = 1775.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-029	CARD NUMBER	2	CARD NUMBER	3
DATE	1-13-70	WINDBOX ST,H20	0.8100E 01	N.G. FLOW,%SCALE	0.9500E 02
TIME	1145	BURNER DP,H20	0.6200E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H20	0.1800E 01	SCREW SPEED,RPM	0.4000E 03
PRI.AIR DP,H20	0.2500E 01	PP EXIT ST,HG	-0.2000E 01	O2 FURN.EX.%-BM	0.2800E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H20	0.5400E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.1000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2907E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.8500E 02	PART.SCRUB.IN	0.4900E 03
ABS NOZ.,PSIG	0.3000E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1420E 03
ABS LOAD,PSIG	0.3550E 02	WINDBOX-WEST	0.6500E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6000E 00	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	4	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANDOMETER CODE	0	NO.1 BANK OUT	0.8350E 03	PRI.AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.7100E 03	PRI.AIR WGT BULB	0.5250E 02
CARD NUMBER	7	FURN. EXIT	0.5400E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	3	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H20	0.7200E 01				
PART.CYC.DP,H20	0.5400E 01				
#1 ORIF.ST,HG	-0.9000E 00				
#1 ORIF.DP,H20	0.4800E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H20	0.0	FBA INLET ST,HG	-0.1300E 01
ABS CYC.DP,H20	0.0	FBA SUMP DP,H20	0.9000E 00
		FBA DP,H20	0.4800E 01
		FBA DEMIST.DP,H20	0.1100E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART.CYC.EXIT	0.1390E 03	PART.INIT.GAL	0.3030E 05
FBA INLET	0.1320E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.3032E 05
FBA EXIT	0.1260E 03	PART.CYC.SUMP	0.1330E 03	PART.TIME,MIN	0.3000E 01
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.0	ABS H20 IN.GAL	0.6366E 04
PART.CYC.SUMP	0.1290E 03	FBA SUMP	0.1320E 03	ABS H20 FI.GAL	0.6368E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.6600E 02	ABS H20 TIME,MIN	0.3000E 01
FBA SUMP	0.1280E 03	MGOH2 TANK	0.7000E 02	MGO ROTO.SCALE,%	0.1800E 02
MGO SLAK TANK	0.6500E 02			MAKEUP SETTING	0.1800E 02
MGOH2 TANK	0.6800E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-029

DATE 1-13-70

TIME OF DAY 1145

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	512.	120.0	---	---	---	---	0.004	39.1	509.	21.7
SECONDARY AIR	4989.	645.0	---	---	---	---	0.004	38.8	4968.	8.1
FURNACE EXIT	5953.	540.0	2902.3	*****	*****	*****	0.048	110.2	5682.	1.0
PART.SCRB.INLET	5953.	490.0	*****	*****	*****	*****	0.048	110.2	---	0.0
PART.CYC.EXIT	5959.	139.0	2890.6	*****	*****	*****	0.103	133.9	5402.	-12.2
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5959.	132.0	*****	*****	*****	*****	0.103	133.9	---	-17.6
FLOATING BED EX	6280.	126.0	*****	*****	*****	*****	0.094	129.4	---	-27.1
P.P. EXIT ORIF.	6280.	126.0	264.1	*****	*****	*****	0.094	129.4	5741.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.33	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	133.0	4.99	MAKEUP MGD SL.	*****	60.0 5.0
RECIRCULATED LIQ.	133.0	23.76	PRODUCT LIQ.	4.2	68.0 3.2
			REC.(SPRAY NOZ)	*****	132.0 12.2
			REC.(FLOW NOZ.)	*****	132.0 323.3
				*****	161.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.599E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	476.5
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	13.3
OXYGEN,% DRY, MEAS.	2.80
CO2,% DRY-CALC.	15.66
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	0.40
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	161.4
LIQ/GAS,GAL/MCF	14.8
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	7.2

VENT ABS.

VENT ABS.	*****
*****	90.86
*****	*****
*****	*****
*****	*****
*****	13.4
*****	11.3
*****	1.5
*****	4.8

FLOAT.BED

FLOAT.BED	90.86
*****	*****
*****	*****
*****	*****
*****	13.4
*****	11.3
*****	1.5
*****	4.8

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	28.4
SULFITE/SO2-MOL/MOL	=	3.08
SUMP RESID.TIME,MIN	=	9.7

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	*****
O2 AT FURN.EX.=	2.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	28.4
SULFITE/SO2-MOL/MOL	=	3.08
SUMP RESID.TIME,MIN	=	9.7

SO2 ABSORPTION PARAMETERS

KGA,#MOLE/HR-FT2,	=	28.4
SULFITE/SO2-MOL/MOL	=	3.08
SUMP RESID.TIME,MIN	=	9.7

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-029

DATE 1-13-70

TIME OF DAY 1145

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.485010
HYDROGEN 0.505299
OXYGEN 1.392271
NITROGEN 5.039457
SULFUR 0.009240

FEED RATE, #/SEC= 1.66

ENTHALPY, BTU/# = 223.

DRY GAS

5672.
5682.

WATER

252.5
271.1

FLYASH

35.26

MAGNESIUM

SULFUR

17.63
17.18

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

17.18
16.26

2940.
3054.

5682.
5402.

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

16.26
19.98

8.65
10.97

1032.
1213.

5402.
5741.

*

*SO2 ABSORBERS- PRODUCT COMP.

GRAM/
100ML

GM-MOLE/
LITER

GM SO2/
100ML

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 7.60
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

5.04
4.00
1.04
2.96
1.10
1.86
1.84
0.0

4.00

0.7878
0.6250
0.1628
0.4623
0.1719
0.2904
0.1438
0.0

0.6250

1.787
6.156
2.674
0.0

7.194

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.00
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 3.40
FLYASH CONC. GM/100ML = 0.97

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-030	CARD NUMBER	2	CARD NUMBER	3
DATE	1-13-70	WINDBOX ST,H2O	0.9000E 01	N.G. FLOW,%SCALE	0.9500E 02
TIME	1520	BURNER DP,H2O	0.5600E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST,HG	0.1500E 01	FURN. ST,H2O	0.3500E 01	SCREW SPEED,RPM	0.4000E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.2600E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2905E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.5050E 03
ABS NOZ.,PSIG	0.3000E 02	WINDBOX-TOP	0.6500E 03	#1 DRIFICE	0.1420E 03
ABS LOAD,PSIG	0.3500E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6500E 00	WINDBOX-BOT.	0.6420E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	4	WINDBOX-EAST	0.8620E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7400E 03	PRI.AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.5700E 03	PRI.AIR WGT BULB	0.5350E 02
CARD NUMBER	7	FURN. EXIT	0.1250E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	3	COAL-AIR		SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.6500E 01				
PART.CYC.DP,H2O	0.5200E 01				
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4400E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1000E 01
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
		FBA DP,H2O	0.4900E 01
		FBA DEMIST.DP,H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1350E 03	PART.CYC.EXIT	0.1400E 03	PART.INIT.GAL	0.3134E 05
FBA INLET	0.1330E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.3162E 05
FBA EXIT	0.1270E 03	PART.CYC.SUMP	0.1330E 03	PART.TIME,MIN	0.5800E 02
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.6500E 04
PART.CYC.SUMP	0.1305E 03	FBA SUMP	0.1320E 03	ABS H2O FI.GAL	0.6548E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.7500E 02	ABS H2O TIME,MIN	0.5800E 02
FBA SUMP	0.1060E 03	MGOH2 TANK	0.7500E 02	MGO ROTO.SCALE,%	0.3000E 02
MGO SLAK TANK	0.7400E 02			MAKEUP SETTING	0.3000E 02
MGOH2 TANK	0.7400E 02				
MAKEUP WATER	0.4500E 02				

RUN NUMBER D-030

DATE 1-13-70

TIME OF DAY 1520

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	498.	125.0	---	---	---	---	0.005	42.2	496.	20.3
SECONDARY AIR	4965.	644.3	---	---	---	---	0.004	38.8	4944.	9.0
FURNACE EXIT	5917.	570.0	3099.5	---	---	---	0.048	110.7	5645.	2.8
PART.SCRB.INLET	5917.	505.0	---	---	---	---	0.048	110.7	---	1.4
PART.CYC.EXIT	5729.	140.0	2947.4	---	---	---	0.098	132.4	5218.	-9.5
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5729.	133.0	*****	*****	*****	*****	0.098	132.4	---	-13.5
FLOATING BED EX	6057.	127.0	*****	*****	*****	*****	0.089	127.8	---	-25.7
P.P. EXIT ORIF.	6057.	127.0	124.0	*****	*****	*****	0.089	127.8	5562.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE	45.0	4.89	MAKEUP WATER	*****	*****	45.0	6.9
MAKEUP WATER	133.0	5.09	MAKEUP MGD SL.	*****	4.2	74.0	4.0
PRODUCT LIQ.	133.0	23.76	PRODUCT LIQ.	*****	*****	132.0	12.5
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	*****	132.0	323.3
			REC.(FLOW NOZ.)	*****	*****		167.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.601E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	478.3
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	12.4
OXYGEN,% DRY, MEAS.	2.60
CO2,% DRY-CALC.	15.84
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	4.91
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	153.9
LIQ/GAS,GAL/MCF	15.6
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.5

VENT ABS.

FLOAT.BED

95.79

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	36.4
SULFITE/SO2-MOL/MOL	=	2.54
SUMP RESID.TIME,MIN	=	9.4

CONC.,GM-MOLE/L=	0.0206
MOL% TOTAL SULF=	2.86
O2 AT FURN.EX.=	2.60
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-030

DATE 1-13-70

TIME OF DAY 1520

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	17.70	---	---	35.39	253.5	5635.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	18.21	---	---	*****	272.1	5645.	CARBON 0.489806
							HYDROGEN 0.515414
							OXYGEN 1.391704
PART. SCRUBBER							NITROGEN 5.035043
INPUT, #/HR	18.21	---	---	*****	2718.	5645.	SULFUR 0.009332
OUTPUT, #/HR	16.01	---	---	*****	3059.	5218.	
							FEED RATE, #/SEC= 1.65
SO2 ABSORBERS							ENTHALPY, BTU/# = 93.
INPUT, #/HR	16.01	11.23	*****		1149.	5218.	
OUTPUT, #/HR	18.95	13.04	*****		1176.	5562.	

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGD COMPOSITION
COMBINED	100ML	LITER	100ML	SLURRY CONC.- GM MGD/100ML = 7.70
FREE	4.74	0.7409	---	MGD PRESKAKED, NO=0, YES=1 0
MONO(TOTAL)	4.51	0.7045	---	% SLAKED TO MG(OH)2, MEAS. = 44.70
MONO(DISSOLVED)	0.23	0.0364	---	
MONO(SOLID)	4.28	0.6682	---	
BISULFITE	0.86	0.1344	1.397	PRODUCT MG BASE PHYSICAL PROPERTIES
MGO	3.42	0.5338	11.316	ACID STRENGTH, PH = 6.50
SULFATE	1.04	0.0813	1.511	SP.GRAVITY, HYDROM. = 1.0520
MAGNESIUM	0.0	0.0	0.0	
FLYASH	0.13	0.0206	0.247	PARTICULATE SCRUBBER PRODUCT
SOLIDS, MG	4.64	0.7251	---	ACID STRENGTH, PH = 3.00
	---	---	*****	FLYASH CONC. GM/100ML = 0.88
	---	---	10.085	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-031	CARD NUMBER	2	CARD NUMBER	3
DATE	1-16-70	WINDBOX ST,H2O	0.9700E 01	N.G. FLOW,%SCALE	0.9600E 02
TIME	1200	BURNER DP,H2O	0.5900E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.3700E 01	SCREW SPEED,RPM	0.4000E 03
PRI.AIR DP,H2O	0.2500E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.2800E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5400E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.3000E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.6650E 03	PART.SCRUB.IN	0.5300E 03
ABS NOZ.,PSIG	0.5500E 01	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.1150E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	2	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9050E 03	PRI.AIR FAN IN.	0.7500E 02
		NO.2 BANK OUT	0.7650E 03	PRI.AIR WGT BULB	0.5350E 02
CARD NUMBER	7	FURN. EXIT	0.5850E 03	SEC.AIR FAN IN.	0.4300E 02
MODE OF OPER.	3	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.3700E 02
PART.SCR.ST,HG	0.1500E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.7300E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
PART.CYC.DP,H2O	0.5400E 01	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1000E 01
#1 ORIF.ST,HG	-0.8000E 00			FBA DP,H2O	0.4200E 01
#1 ORIF.DP,H2O	0.4800E 01			FBA DEMIST.DP,H2O	0.1100E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1370E 03	PART.CYC.EXIT	0.1410E 03	PART.INIT.GAL	0.3416E 05
FBA INLET	0.1370E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.3423E 05
FBA EXIT	0.1320E 03	PART.CYC.SUMP	0.1360E 03	PART.TIME,MIN	0.1550E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.7252E 04
PART.CYC.SUMP	0.1320E 03	FBA SUMP	0.1310E 03	ABS H2O FI.GAL	0.7262E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.2000E 03	ABS H2O TIME,MIN	0.1550E 02
FBA SUMP	0.1280E 03	MGOH2 TANK	0.8400E 02	MGO ROTO.SCALE,%	0.2200E 02
MGO SLAK TANK	0.2000E 03			MAKEUP SETTING	0.2200E 02
MGOH2 TANK	0.8200E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER D-031

DATE 1-16-70

TIME OF DAY 1200

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	519.	120.0	---	---	---	---	0.004	40.1	517.	21.7
SECONDARY AIR	5050.	646.3	---	---	---	---	0.004	36.6	5031.	9.7
FURNACE EXIT	6028.	585.0	2930.3	---	---	---	0.047	111.2	5756.	3.0
PART.SCRB.INLET	6028.	530.0	*****	5.1	*****	*****	0.047	111.2	---	2.0
PART.CYC.EXIT	6051.	141.0	3097.3	*****	*****	*****	0.106	136.2	5470.	-10.8
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	6051.	137.0	*****	*****	*****	*****	0.106	136.2	---	-14.9
FLOATING BED EX	6368.	132.0	*****	*****	*****	*****	0.099	132.4	---	-25.7
P.P. EXIT ORIF.	6368.	130.0	513.6	*****	*****	*****	0.099	132.4	5796.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	4.65	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	136.0	5.09	MAKEUP MGO SL.	*****	60.0 5.2
PRODUCT LIQ.	136.0	23.76	PRODUCT LIQ.	4.2	82.0 3.5
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	131.0 12.0
			REC.(FLOW NOZ.)	*****	131.0 33.2
				*****	33.2

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.607E 07
% FUEL AS COAL	96.8
COAL FLOW RATE,#/HR	482.4
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	13.3
OXYGEN,% DRY, MEAS.	2.80
CO2,% DRY-CALC.	15.66
HUMIDITY,#/# - CALC.	0.047

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-5.70
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	158.9
LIQ/GAS,GAL/MCF	15.1
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	7.3

VENT ABS.

FLOAT.BED

*****	83.42
*****	*****
*****	*****
*****	*****
*****	13.2
*****	2.4
*****	0.3
*****	4.2

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2,	= *****
SULFITE/SO2-MOL/MOL	= *****
SUMP RESID.TIME,MIN	= *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2	= 21.5
SULFITE/SO2-MOL/MOL	= 0.53
SUMP RESID.TIME,MIN	= 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0312
MOL% TOTAL SULF=	5.06
O2 AT FURN.EX.=	2.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-031

DATE 1-16-70

TIME OF DAY 1200

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
17.85	---	35.70	253.3	5745.
17.57	---	*****	272.3	5756.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.484939
HYDROGEN 0.506068
OXYGEN 1.392263
NITROGEN 5.039526
SULFUR 0.009236

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
17.57	---	*****	2597.	5756.
17.65	---	*****	3130.	5470.

FEED RATE, #/SEC = 1.68

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
17.65	8.71	*****	1084.	5470.
17.75	8.89	*****	1243.	5796.

ENTHALPY, BTU/# = 467.

* SO2 ABSORBERS-
PRODUCT COMP.

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = 7.00
MGD PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGD
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
3.88	0.6062	---
3.10	0.4836	---
0.78	0.1225	---
2.31	0.3611	---
1.00	0.1562	1.625
1.31	0.2049	4.343
1.64	0.1281	2.383
0.0	0.0	0.0
0.20	0.0312	0.375
3.30	0.5149	---
---	---	*****
---	---	5.479

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.20
SP.GRAVITY, HYDROM. = 1.0470

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.90
FLYASH CONC. GM/100ML = 1.68

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-032	CARD NUMBER	2	CARD NUMBER	3
DATE	1-16-70	WINDBOX ST,H2O	0.9800E 01	N.G. FLOW,%SCALE	0.9600E 02
TIME	1335	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.3800E 01	SCREW SPEED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2500E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.2700E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3100E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.3000E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.9000E 02	PART.SCRUB.IN	0.5400E 03
ABS NOZ.,PSIG	0.5000E 01	WINDBOX-TOP	0.6620E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.1300E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	2	WINDBOX-EAST	0.6520E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9100E 03	PRI.AIR FAN IN.	0.7550E 02
		NO.2 BANK OUT	0.7900E 03	PRI.AIR WGT BULB	0.5450E 02
		FURN. EXIT	0.5950E 03	SEC.AIR FAN IN.	0.4450E 02
		COAL-AIR	0.1300E 03	SEC.AIR WET BULB	0.3800E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	3	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
PART.SCR.ST,HG	0.1500E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.9000E 00
PART.SCR.DP,H2O	0.7200E 01			FBA DP,H2O	0.4000E 01
PART.CYC.DP,H2O	0.5400E 01			FBA DEMIST.DP,H2O	0.1100E 01
#1 ORIF.ST,HG	-0.8000E 00				
#1 ORIF.DP,H2O	0.4800E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART.CYC.EXIT	0.1410E 03	PART.INIT.GAL	0.3459E 05
FBA INLET	0.1370E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.3460E 05
FBA EXIT	0.1320E 03	PART.CYC.SUMP	0.1370E 03	PART.TIME,MIN	0.2000E 01
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.7296E 04
PART.CYC.SUMP	0.1330E 03	FBA SUMP	0.1330E 03	ABS H2O FI.GAL	0.7298E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.2000E 03	ABS H2O TIME,MIN	0.2000E 01
FBA SUMP	0.1300E 03	MGOH2 TANK	0.4500E 02	MGO ROTO.SCALE,%	0.3600E 02
MGO SLAK TANK	0.2000E 03			MAKEUP SETTING	0.3600E 02
MGOH2 TANK	0.8400E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-032 DATE 1-16-70 TIME OF DAY 1335

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	515.	130.0	-----	-----	-----	-----	0.005	42.6	512.	21.7
SECONDARY AIR	5050.	646.0	-----	-----	-----	-----	0.004	37.2	5031.	9.8
FURNACE EXIT	6025.	595.0	3085.3	2.4	-----	-----	0.048	111.5	5751.	3.1
PART.SCRB.INLET	6025.	540.0	-----	-----	-----	-----	0.048	111.5	-----	2.0
PART.CYC.EXIT	6046.	141.0	2915.0	-----	-----	-----	0.110	137.4	5446.	-10.8
VENT ABS.INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC.EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	6046.	137.0	-----	-----	-----	-----	0.110	137.4	-----	-14.9
FLOATING BED EX	6289.	132.0	-----	-----	-----	-----	0.104	134.2	-----	-25.7
P.P. EXIT ORIF.	6289.	132.0	490.6	-----	-----	-----	0.104	134.2	5696.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE	60.0	5.00	MAKEUP WATER	-----	-----	60.0	7.1
MAKEUP WATER	137.0	5.09	MAKEUP MGO SL.	-----	4.2	84.0	4.5
PRODUCT LIQ.	137.0	23.76	PRODUCT LIQ.	-----	-----	133.0	12.0
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ)	-----	-----	133.0	27.1
-----	-----	-----	REC.(FLOW NOZ.)	-----	-----	-----	27.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.609E 07	SO2 ABSORB.EFF	5.52	VENT ABS.	-----	VENT FLOW,#/M	-----	TEMP,F	-----	FLOW,F	-----
% FUEL AS COAL	96.8	FLYASH COL.EFF	-----	-----	-----	-----	-----	-----	-----	-----	-----
COAL FLOW RATE,#/HR	484.6	SO3 ABSORB.EFF	-----	-----	-----	-----	-----	-----	-----	-----	-----
NAT.GAS FLOW,#/HR	8.8	NOX ABSORB.EFF	-----	-----	-----	-----	-----	-----	-----	-----	-----
% EXCESS AIR	12.9	GAS VELOCITY,FPS	159.1	-----	-----	-----	-----	-----	-----	-----	-----
OXYGEN,% DRY, MEAS.	2.70	LIQ/GAS,GAL/MCF	15.1	-----	-----	-----	-----	-----	-----	-----	-----
CO2,% DRY-CALC.	15.75	LIQ/GAS,#/#	2.0	-----	-----	-----	-----	-----	-----	-----	-----
HUMIDITY,#/# - CALC.	0.048	PRES.DROP,IN.WG	7.2	-----	-----	-----	-----	-----	-----	-----	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

CONC.,GM-MOLE/L= 0.0365

MOL% TOTAL SULF= 5.73

O2 AT FURN. EX.= 2.70

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0365

MOL% TOTAL SULF= 5.73

O2 AT FURN. EX.= 2.70

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-032

DATE 1-16-70

TIME OF DAY 1335

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	17.93			35.86	255.0	5741.	
OUTPUT, #/HR	18.47			*****	274.0	5751.	
PART. SCRUBBER							
INPUT, #/HR	18.47			*****	2776.	5751.	
OUTPUT, #/HR	16.53			*****	3148.	5446.	

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

16.53
18.15

11.00
11.00

5446.
5696.

FEED RATE, #/SEC= 1.68

ENTHALPY, BTU/# = 371.

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 6.80
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

4.01
3.84
0.17
3.68
1.16
2.52
0.56
0.0
0.23
4.08

0.6268
0.6008
0.0260
0.5747
0.1812
0.3935
0.0438
0.0
0.0365
0.6372

1.885
8.341
0.814
0.0
0.437

7.240

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.70
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.90
FLYASH CONC. GM/100ML = 0.93

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.487356
HYDROGEN 0.512496
OXYGEN 1.391982
NITROGEN 5.037300
SULFUR 0.009283

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	D-033	CARD NUMBER	2	CARD NUMBER	3
DATE	1-19-70	WINDBOX ST,H2O	0.9700E 01	N.G. FLOW,%SCALE	0.9350E 02
TIME	1035	BURNER DP,H2O	0.7200E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.2400E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.2600E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2900E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2898E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.8500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4400E 02	SEC.AIR ORIF.	0.6680E 03	PART.SCRUB.IN	0.5450E 03
ABS NOZ.,PSIG	0.3000E 02	WINDBOX-TOP	0.6400E 03	#1 ORIFICE	0.1520E 03
ABS LOAD,PSIG	0.3300E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6550E 03	AIR HEATER #1	0.7050E 03
ABSORBER NOZ. CODE	2	WINDBOX-EAST	0.9000E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7600E 03	PRI.AIR FAN IN.	0.7700E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5820E 03	PRI.AIR WGT BULB	0.5400E 02
MODE OF OPER.	3	FURN. EXIT	0.1200E 03	SEC.AIR FAN IN.	0.2000E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR		SEC.AIR WET BULB	0.2000E 02
PART.SCR.DP,H2O	0.7400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5500E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.9000E 00
#1 ORIF.DP,H2O	0.4850E 01			FBA DP,H2O	0.4500E 01
				FBA DEMIST.DP,H2O	0.1200E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.3595E 05
FBA INLET	0.1330E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.3602E 05
FBA EXIT	0.1280E 03	PART.CYC.SUMP	0.1370E 03	PART.TIME,MIN	0.1550E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.7597E 04
PART.CYC.SUMP	0.1290E 03	FBA SUMP	0.1350E 03	ABS H2O FI.GAL	0.7609E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.1567E 02
FBA SUMP	0.1300E 03	MGOH2 TANK	0.8000E 02	MGO ROTO.SCALE,%	0.1900E 02
MGO SLAK TANK	0.7100E 02			MAKEUP SETTING	0.1900E 02
MGOH2 TANK	0.7900E 02				
MAKEUP WATER	0.5200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-033

DATE 1-19-70

TIME OF DAY 1035

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	501.	120.0					0.005	40.2	498.	21.7
SECONDARY AIR	4993.	650.8					0.003	26.7	4979.	9.7
FURNACE EXIT	5950.	582.0	3562.6				0.047	109.6	5685.	2.9
PART.SCRB.INLET	5950.	545.0					0.047	109.6		1.4
PART.CYC.EXIT	5975.	142.0	3378.5				0.105	134.5	5407.	-10.8
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED IN	5975.	133.0	*****	*****	*****	*****	0.105	134.5	*****	-14.9
FLOATING BED EX	6208.	128.0	*****	*****	*****	*****	0.097	130.5	*****	-25.7
P.P. EXIT ORIF.	6208.	128.0	435.2	*****	*****	*****	0.097	130.5	5659.	-25.7

SCRUBBER STREAM DATA

PARTICULATE	TEMP,F	FLOW,GPM
MAKEUP WATER	52.0	4.58
PRODUCT LIQ.	137.0	5.09
RECIRCULATED LIQ.	137.0	23.76

VENTURI ABSORBER

GAS ABSORBER	TEMP,F	FLOW,#/M
MAKEUP WATER	*****	*****
MAKEUP MGO SL.	*****	4.2
PRODUCT LIQ.	*****	*****
REC.(SPRAY NOZ)	*****	*****
REC.(FLOW NOZ.)	*****	*****

FBA

TEMP,F	FLOW,#/M
52.0	6.4
79.0	3.2
135.0	12.0
135.0	138.2
	138.2

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.605E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	482.0
NAT.GAS FLOW,#/HR	8.5
% EXCESS AIR	12.4
OXYGEN,% DRY, MEAS.	2.60
CO2,% DRY-CALC.	15.84
HUMIDITY,#/# - CALC.	0.047

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	= *****
SULFITE/SO2-MOL/MOL	= *****
SUMP RESID.TIME,MIN	= *****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	5.17
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	162.6
LIQ/GAS,GAL/MCF	14.7
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	7.4

VENT ABS.

FLOAT.BED

87.12

13.3
9.8
1.3
4.5

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	= 23.9
SULFITE/SO2-MOL/MOL	= 2.13
SUMP RESID.TIME,MIN	= 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0133
MOL% TOTAL SULF=	1.80
O2 AT FURN.EX.=	2.60
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-033

DATE 1-19-70

TIME OF DAY 1035

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	17.83	---	---	35.67	247.2	5674.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	21.08	---	---	*****	265.4	5685.	CARBON	0.489932
PART. SCRUBBER							HYDROGEN	0.511237
INPUT, #/HR	21.08	---	---	*****	2558.	5685.	OXYGEN	1.391715
OUTPUT, #/HR	19.01	---	---	*****	3116.	5407.	NITROGEN	5.034920
							SULFUR	0.009338

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

FEED RATE, #/SEC= 1.66
ENTHALPY, BTU/# = 993.

* SO2 ABSORBERS-
PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	4.80	0.7505	---
COMBINED	3.77	0.5888	---
FREE	1.04	0.1618	---
MONO(TOTAL)	2.73	0.4270	---
MONO(DISSOLVED)	1.02	0.1594	---
MONO(SOLID)	1.71	0.2677	1.658
BISULFITE	2.04	0.1594	5.674
MGO	0.0	0.0	2.964
SULFATE	0.08	0.0133	0.0
MAGNESIUM	3.85	0.6021	0.159
FLYASH	---	---	---
SOLIDS, MG	---	---	*****
			6.075

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 8.10
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.50
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = 0.92

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-034	CARD NUMBER	2	CARD NUMBER	3
DATE	1-19-70	WINDBOX ST, H2O	0.9400E 01	N.G. FLOW, %SCALE	0.9400E 02
TIME	1255	BURNER DP, H2O	0.6800E 01	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.2500E 01	SCREW SPEED, RPM	0.3900E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. %BM	0.2700E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.3300E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2897E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F	0.8500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4400E 02	SEC. AIR ORIF.	0.6650E 03	PART. SCRUB. IN	0.5450E 03
ABS NOZ., PSIG	0.3000E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.3400E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF. INCH	0.0	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7050E 03
ABSORBER NOZ. CODE	2	WINDBOX-EAST	0.6520E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.9150E 03	PRI. AIR FAN IN.	0.8200E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.7650E 03	PRI. AIR WGT BULB	0.5750E 02
MODE OF OPER.	3	FURN. EXIT	0.6000E 03	SEC. AIR FAN IN.	0.3200E 02
PART. SCR. ST, HG	0.1000E 00	COAL-AIR	0.1250E 03	SEC. AIR WET BULB	0.3200E 02
PART. SCR. DP, H2O	0.7600E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5300E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1100E 01
#1 ORIF. ST, HG	-0.8500E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.9000E 00
#1 ORIF. DP, H2O	0.4600E 01			FBA DP, H2O	0.4700E 01
				FBA DEMIST. DP, H2O	0.1200E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1350E 03	TEMP. THERMOMETERS, F	0.1420E 03	MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.3661E 05
FBA INLET	0.1280E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.3671E 05
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.1360E 03	PART. TIME, MIN	0.1915E 02
P.P. EXIT	0.1300E 03	ABS CYC. SUMP	0.1350E 03	ABS H2O IN. GAL	0.7702E 04
PART. CYC. SUMP	0.0	FBA SUMP	0.0	ABS H2O FI. GAL	0.7723E 04
ABS CYC. SUMP	0.1300E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.1915E 02
FBA SUMP	0.0	MGOH2 TANK	0.8300E 02	MGO ROTO. SCALE, %	0.3000E 02
MGO SLAK TANK	0.7900E 02			MAKEUP SETTING	0.3000E 02
MGOH2 TANK	0.5200E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-034

DATE 1-19-70

TIME OF DAY 1255

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	498.	125.0	---	---	---	---	0.005	45.1	495.	21.7
SECONDARY AIR	4989.	646.8	---	---	---	---	0.004	38.9	4968.	9.4
FURNACE EXIT	5941.	600.0	3330.8	---	---	5.4823	0.048	110.5	5669.	3.3
PART.SCRB.INLET	5941.	545.0	-----	-----	-----	-----	0.048	110.5	-----	1.4
PART.CYC.EXIT	5804.	142.0	3193.6	-----	-----	-----	0.110	135.8	5230.	-11.5
VENT ABS.INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC.EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	5804.	134.0	-----	-----	-----	-----	0.110	135.8	-----	-14.9
FLOATING BED EX	6195.	128.0	-----	-----	-----	-----	0.104	132.6	-----	-25.7
P.P. EXIT ORIF.	6195.	128.0	196.0	-----	-----	-----	0.104	132.6	5613.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	TEMP,F	VENTURI ABSORBER TEMP,F	FBA TEMP,F	FLOW,#/M
PARTICULATE	52.0	5.33	-----	-----	-----	52.0	9.1
MAKEUP WATER	136.0	5.09	MAKEUP MGO SL.	4.2	-----	79.0	4.0
PRODUCT LIQ.	136.0	23.76	PRODUCT LIQ.	-----	-----	135.0	12.0
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	-----	-----	135.0	138.2
			REC.(FLOW NOZ.)	-----	-----		138.2

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.601E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	478.0
NAT.GAS FLOW,#/HR	8.5
% EXCESS AIR	12.9
OXYGEN,% DRY, MEAS.	2.70
CO2,% DRY-CALC.	15.75
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

	SO2 ABSORB.EFF	FLYASH COL.EFF	SO3 ABSORB.EFF	NOX ABSORB.EFF	GAS VELOCITY,FPS	LIQ/GAS,GAL/MCF	LIQ/GAS,#/#	PRES.DROP,IN.WG
PART.	4.12	-----	-----	-----	158.8	15.1	2.0	7.6

FLOAT.BED

VENT ABS.	93.86
-----	-----
-----	-----
-----	-----
-----	-----
-----	13.3
-----	9.7
-----	1.3
-----	4.7

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 32.4

SULFITE/SO2-MOL/MOL = 2.27

SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0216

MOL% TOTAL SULF= 3.36

O2 AT FURN.EX.= 2.70

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-034

DATE 1-19-70

TIME OF DAY 1255

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	17.69			35.37	253.8	5659.	
OUTPUT, #/HR	19.66			51.86	272.1	5669.	
PART. SCRUBBER							
INPUT, #/HR	19.66			51.86	2937.	5669.	
OUTPUT, #/HR	17.39			*****	3123.	5230.	

SO2 ABSORBERS

INPUT, #/HR	17.39	11.37	*****	1347.	5230.	
OUTPUT, #/HR	16.52	9.08	*****	1254.	5613.	

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	4.15	0.6477	-----
COMBINED	3.23	0.5045	-----
FREE	0.92	0.1432	-----
MONO(TOTAL)	2.31	0.3613	-----
MONO(DISSOLVED)	1.02	0.1594	1.657
MONO(SOLID)	1.29	0.2019	4.280
BISULFITE	1.60	0.1250	2.325
MGO	0.0	0.0	0.0
SULFATE	0.14	0.0216	0.259
MAGNESIUM	3.37	0.5261	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	7.153

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.487478
 HYDROGEN 0.518587
 OXYGEN 1.391993
 NITROGEN 5.037182
 SULFUR 0.009289

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 185.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.80
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.00
 SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.60
 FLYASH CONC. GM/100ML = 0.84

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-035	CARD NUMBER	2	CARD NUMBER	3
DATE	1-19-70	WINDBOX ST,H2O	0.9300E 01	N.G. FLOW,%SCALE	0.9350E 02
TIME	1510	BURNER DP,H2O	0.6800E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.2600E 01	SCREEN SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.2400E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3300E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2898E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.8200E 02	PART.SCRUB.IN	0.5450E 03
ABS NOZ.,PSIG	0.5500E 01	WINDBOX-TOP	0.6580E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.1200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	2	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9100E 03	PRI.AIR FAN IN.	0.8500E 02
		NO.2 BANK OUT	0.7750E 03	PRI.AIR WGT BULB	0.5850E 02
CARD NUMBER	7	FURN. EXIT	0.6000E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	3	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.7600E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	0.1100E 01
PART.CYC.DP,H2O	0.5400E 01	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
#1 ORIF.ST,HG	-0.8500E 00			FBA DP,H2O	0.4200E 01
#1 ORIF.DP,H2O	0.4600E 01			FBA DEMIST.DP,H2O	0.1100E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1380E 03	PART.CYC.EXIT	0.1430E 03	PART.INIT.GAL	0.3731E 05
FBA INLET	0.1360E 03	ABS CYC.EXIT	0.0	PART.FINAL.GAL	0.3739E 05
FBA EXIT	0.1300E 03	PART.CYC.SUMP	0.1370E 03	PART.TIME,MIN	0.1434E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.7806E 04
PART.CYC.SUMP	0.1320E 03	FBA SUMP	0.1320E 03	ABS H2O FI.GAL	0.7815E 04
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.1434E 02
FBA SUMP	0.1280E 03	MGOH2 TANK	0.8300E 02	MGO ROTO.SCALE,%	0.1900E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1900E 02
MGOH2 TANK	0.8150E 02				
MAKEUP WATER	0.5400E 02				

RUN NUMBER D-035

DATE 1-19-70

TIME OF DAY 1510

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	498.	125.0	---	---	---	---	0.005	44.9	496.	21.7
SECONDARY AIR	5004.	642.0	---	---	---	---	0.004	38.9	4982.	9.3
FURNACE EXIT	5964.	600.0	3267.9	---	---	---	0.049	111.0	5688.	3.3
PART.SCRB.INLET	5964.	545.0	---	---	---	---	0.049	111.0	---	1.4
PART.CYC.EXIT	5801.	143.0	2841.4	---	---	---	0.111	136.2	5221.	-11.5
VENT ABS.INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC.EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	5801.	136.0	---	---	---	---	0.111	136.2	---	14.9
FLOATING BED EX	6190.	130.0	---	---	---	---	0.103	132.4	---	-25.7
P.P. EXIT ORIF.	6190.	130.0	533.7	---	---	---	0.103	132.4	5613.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	54.0	5.37	---	-----	---
MAKEUP WATER	137.0	5.09	MAKEUP MGO SL.	4.2	54.0
PRODUCT LIQ.	137.0	23.76	PRODUCT LIQ.	---	81.5
RECIRCULATED LIQ.	---	---	REC.(SPRAY NOZ)	---	132.0
---	---	---	REC.(FLOW NOZ.)	---	132.0
---	---	---	---	---	33.2
---	---	---	---	---	33.2

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
HEAT RELEASE,BTU/HR	0.612E 07	96.9	5.37	---	-----	---
FUEL AS COAL	487.3	8.5	5.09	MAKEUP MGO SL.	4.2	54.0
COAL FLOW RATE,#/HR	11.4	11.4	23.76	PRODUCT LIQ.	---	81.5
NAT.GAS FLOW,#/HR	2.40	16.02	---	REC.(SPRAY NOZ)	---	132.0
EXCESS AIR	0.049	0.049	---	REC.(FLOW NOZ.)	---	132.0
OXYGEN,SDRY,MEAS.	---	---	---	---	---	33.2
CO2,SDRY-CALC.	---	---	---	---	---	33.2
HUMIDITY,#/# - CALC.	---	---	---	---	---	33.2

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****
 ***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2 = 19.4
 SULFITE/SO2-MOL/MOL = 0.61
 SUMP RESID.TIME,MIN = 9.8

CONC.,GM-MOLE/L= 0.0312
 MOL% TOTAL SULF= 4.77
 O2 AT FURN. EX.= 2.40
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-035

DATE 1-19-70

TIME OF DAY 1510

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
18.03	---	36.06	258.3	5677.
19.33	---	*****	276.6	5688.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
19.33	---	*****	2963.	5688.
15.43	---	*****	3128.	5221.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
15.43	8.15	*****	1074.	5221.
18.40	8.47	*****	1248.	5613.

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
4.06	0.6339	---
2.94	0.4596	---
1.12	0.1743	---
1.83	0.2853	---
1.02	0.1594	1.658
0.81	0.1259	2.669
2.20	0.1719	3.197
0.0	0.0	0.0
0.20	0.0312	0.375
3.14	0.4908	---
---	---	*****
---	---	2.463

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 7.00
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.90
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.60
FLYASH CONC. GM/100ML = 0.81

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.494755
HYDROGEN 0.524396
OXYGEN 1.391151
NITROGEN 5.030480
SULFUR 0.009432

FEED RATE, #/SEC= 1.66

ENTHALPY, BTU/# = -95.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-036				
DATE	1-21-70				
TIME	1200				
PRI. AIR ST, HG	0.1600E 01				
PRI. AIR DP, H2O	0.2400E 01				
SEC. AIR ST, HG	0.1600E 01				
SEC. AIR DP, H2O	0.2300E 01				
CARD NUMBER	2				
WINDBOX ST, H2O	0.1100E 02				
BURNER DP, H2O	0.7100E 01				
FURN. ST, H2O	0.4100E 01				
PP EXIT ST, HG	-0.1900E 01				
PP EXIT DP, H2O	0.5300E 01				
FURN. EX. ST, H2O	0.5200E 01				
PEEPSITE DP, HG	0.0				
P. SITE ST, PSIG	0.0				
CARD NUMBER	3				
N.G. FLOW, %SCALE	0.9500E 02				
N.G. STATIC, R.O.	0.8200E 01				
SCREW SPEED, RPM	0.3700E 03				
O2 FURN. EX. % - BM	0.2800E 01				
COMB. FURN. EX. %	0.0				
ELE. CHEM. MILVOLT	0.0				
CELL TEMP, F	0.0				
BAROMETRIC, HG	0.2919E 02				
CARD NUMBER	4				
PART. NOZ., PSIG	0.4200E 02				
PART. LOAD, PSIG	0.4350E 02				
ABS NOZ., PSIG	0.1100E 02				
ABS LOAD, PSIG	0.1600E 02				
ABS ORIF. INCH	0.9500E 01				
ABSORBER NOZ. CODE	1				
MANOMETER CODE	1				
CARD NUMBER	5				
TEMP. FURN. RECORDER, F	0.8000E 02				
SEC. AIR ORIF.	0.6650E 03				
WINDBOX-TOP	0.6400E 03				
WINDBOX-WEST	0.6400E 03				
WINDBOX-BOT.	0.6550E 03				
WINDBOX-EAST	0.9500E 03				
NO.1 BANK OUT	0.8250E 03				
NO.2 BANK OUT	0.6300E 03				
FURN. EXIT	0.1250E 03				
COAL-AIR					
CARD NUMBER	6				
TEMP. CONTINUED					
PART. SCRUB. IN	0.5450E 03				
#1 ORIFICE	0.1500E 03				
FBA INLET	0.0				
AIR HEATER #1	0.7000E 03				
AIR HEATER #2	0.7000E 03				
PRI. AIR FAN IN.	0.8300E 02				
PRI. AIR WGT BULB	0.5700E 02				
SEC. AIR FAN IN.	0.2000E 02				
SEC. AIR WGT BULB	0.2000E 02				
CARD NUMBER	7				
PART. SCR. ST, HG	0.2500E 00				
PART. SCR. DP, H2O	0.7200E 01				
PART. CYC. DP, H2O	0.5300E 01				
#1 ORIF. ST, HG	-0.9000E 00				
#1 ORIF. OP, H2O	0.4500E 01				
CARD NUMBER	8				
VENT. ABS. DP, H2O	0.0				
ABS CYC. DP, H2O	0.0				
CARD NUMBER	9				
FBA INLET ST, HG	-0.1000E 01				
FBA SUMP DP, H2O	0.1000E 01				
FBA DP, H2O	0.5500E 01				
FBA DEMIST. DP, H2O	0.1150E 01				
CARD NUMBER	10				
TEMP. PILOT RECORDER, F	0.1350E 03				
#1 ORIFICE	0.1360E 03				
FBA INLET	0.1310E 03				
FBA EXIT	0.1300E 03				
P.P. EXIT	0.1320E 03				
PART. CYC. SUMP	0.0				
ABS CYC. SUMP	0.1300E 03				
FBA SUMP	0.7700E 02				
MGO SLAK TANK	0.9500E 02				
MGOH2 TANK	0.6000E 02				
CARD NUMBER	11				
TEMP. THERMOMETERS, F	0.1440E 03				
PART. CYC. EXIT	0.0				
ABS CYC. EXIT	0.1380E 03				
PART. CYC. SUMP	0.0				
ABS CYC. SUMP	0.1360E 03				
FBA SUMP	0.0				
MGO SLAK TANK	0.9500E 02				
MGOH2 TANK					
CARD NUMBER	12				
MAKEUP FLOWS					
PART. INIT. GAL	0.3962E 05				
PART. FINAL, GAL	0.3972E 05				
PART. TIME, MIN	0.1800E 02				
ABS H2O IN. GAL	0.8280E 04				
ABS H2O FI. GAL	0.8333E 04				
ABS H2O TIME, MIN	0.1800E 02				
MGO ROTO. SCALE, %	0.1600E 02				
MAKEUP SETTING	0.1600E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-036

DATE 1-21-70

TIME OF DAY 1200

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	500.	125.0	---	---	---	---	0.005	42.3	498.	21.7
SECONDARY AIR	5033.	650.0	---	---	---	---	0.003	26.7	5019.	11.0
FURNACE EXIT	5989.	630.0	3683.5	---	---	2.9490	0.046	109.8	5724.	5.2
PART-SCRUB-INLET	5989.	545.0	---	---	---	---	0.046	109.8	---	3.4
PART-CYC-EXIT	5746.	144.0	3643.5	---	---	0.0383	0.111	136.3	5174.	-12.2
VENT ABS-INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC-EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	5746.	136.0	-----	-----	-----	-----	0.111	136.3	-----	-13.5
FLOATING BED EX	6192.	131.0	-----	-----	-----	-----	0.114	135.9	-----	-25.7
P.P. EXIT ORIF.	6192.	130.0	481.1	-----	-----	0.0458	0.114	135.9	5558.	-25.7

SCRUBBER STR-AM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.42	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	138.0	5.09	MAKEUP MGO SL.	-----	60.0 24.8
PRODUCT LIQ.	138.0	23.76	PRODUCT LIQ.	4.2	95.0 3.0
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	-----	136.0 12.0
			REC.(FLOW NOZ.)	-----	136.0 217.7
				-----	252.6

FURNACE PERFORMANCE

	0.603E 07
HEAT RELEASE,BTU/HR	96.8
% FUEL AS COAL	480.0
COAL FLOW RATE,#/HR	8.6
NAT.GAS FLOW,#/HR	13.3
% EXCESS AIR	2.80
OXYGEN,% DRY, MEAS.	15.66
CO2,% DRY-CALC.	0.046
HUMIDITY,#/# - CALC.	

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	1.09
FLYASH COL.EFF	98.70
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	156.9
LIQ/GAS,GAL/MCF	15.3
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	7.2

FLOAT.BED

86.79
-19.65

13.3
17.8
2.4
5.5

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 23.3

SULFITE/SO2-MOL/MOL = 4.82

SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.1130

MOL% TOTAL SULF= 12.00

O2 AT FURN.EX.= 2.80

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-036

DATE 1-21-70

TIME OF DAY 1200

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.485034
 HYDROGEN 0.510805
 OXYGEN 1.392272
 NITROGEN 5.039434
 SULFUR 0.009241

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	17.76	---	35.52	246.4	5713.
OUTPUT, #/HR	21.96	---	28.17	265.0	5724.

PART. SCRUBBER	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	21.96	---	28.17	2976.	5724.
OUTPUT, #/HR	19.63	---	16.87	3121.	5174.

SO2 ABSORBERS	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	19.63	9.01	0.33	2225.	5174.
OUTPUT, #/HR	24.97	12.79	*****	1279.	5558.

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	5.46	0.8524	---
COMBINED	4.02	0.6281	---
FREE	1.44	0.2243	---
MONO(TOTAL)	2.58	0.4038	---
MONO(DISSOLVED)	1.34	0.2094	2.177
MONO(SOLID)	1.24	0.1944	4.121
BISULFITE	3.08	0.2406	4.476
MGO	0.0	0.0	0.0
SULFATE	0.72	0.1130	1.356
MAGNESIUM	4.74	0.7411	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	4.386

MAKEUP MGO COMPOSITION
 SLURRY CONC.- GM MGO/100ML = 8.30
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = 92.00

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 5.00
 SP.GRAVITY, HYDROM. = 1.0550

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = 2.50
 FLYASH CONC. GM/100ML = 0.65

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-037	CARD NUMBER	CARD NUMBER
DATE	1-21-70	WINDBOX ST,H2O	N.G. FLOW,%SCALE
TIME	1400	BURNER DP,H2O	N.G. STATIC,R.O.
PRI-AIR ST, HG	0.1600E 01	FURN. ST,H2O	SCREW SPEED,RPM
PRI-AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	02 FURN.EX.%-BM
SEC-AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	COMB.FURN,EX.%
SEC-AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	ELE.CHEM.MILVOLT
		PEEPSITE DP,HG	CELL TEMP,F
		P.SITE ST,PSIG	BAROMETRIC,HG

[illegible]

CARD NUMBER		9
FBA INLET ST,HG	- .1000E	01
FBA SUMP DP,H2O	0 .9000E	00
FBA DP,H2O	0 .5300E	01
FBA DEMIST.DP,H2O	0 .1100E	01

CARD NUMBER	MAKEUP FLOWS	12
PART. INIT. GAL	0.4033E 05	
PART. FINAL. GAL	0.4054E 05	
PART. TIME, MIN	0.3600E 02	
ABS H2O IN. GAL	0.8394E 04	
ABS H2O FI. GAL	0.8413E 04	
ABS H2O TIME, MIN	0.3700E 02	
MGO ROTO. SCALE, %	0.2800E 02	
MAKEUP SETTING	0.2800E 02	

CARD NUMBER	11
TEMP. THERMOMETERS, F	
PART. CYC. EXIT	0.1440E 03
ABS CYC. EXIT	0.0
PART. CYC. SUMP	0.1380E 03
ABS CYC. SUMP	0.0
FBA SUMP	0.1370E 03
MGO SLAK TANK	0.0
MGOH2 TANK	0.9400E 02

CARD NUMBER	TEMP. PILOT RECORDER, F	10
#1 ORIFICE	0.1380E	03
FBA INLET	0.1360E	03
FBA EXIT	0.1320E	03
P.P. EXIT	0.1310E	03
PART. CYC. SUMP	0.1320E	03
ABS CYC. SUMP	0.0	
FBA SUMP	0.1320E	03
MGO SLAK TANK	0.7600E	02
MGOH2 TANK	0.9300E	02
MAKEUP WATER	0.6000E	02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-037

DATE 1-21-70

TIME OF DAY 1400

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	501.	122.0	---	---	---	---	0.004	39.2	499.	21.7
SECONDARY AIR	5021.	645.0	---	---	---	---	0.003	26.7	5008.	11.8
FURNACE EXIT	5984.	630.0	3523.4	---	---	---	0.047	110.2	5716.	5.1
PART-SCRUB.INLET	5984.	550.0	---	---	---	---	0.047	110.2	---	3.4
PART-CYC.EXIT	5771.	144.0	3543.1	---	698.	---	0.114	137.6	5181.	-8.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED IN	5771.	136.0	*****	*****	*****	*****	0.114	137.6	---	-13.5
FLOATING BED EX	6200.	132.0	*****	*****	*****	*****	0.105	133.3	---	-25.7
P.P. EXIT ORIF.	6200.	131.0	203.5	*****	793.	*****	0.105	133.3	5610.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.75	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	138.0	5.09	MAKEUP MGO SL.	*****	60.0 4.3
PRODUCT LIQ.	138.0	23.76	PRODUCT LIQ.	*****	93.0 3.9
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	137.0 12.0
			REC.(FLOW NOZ.)	*****	137.0 217.7
				*****	248.6

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,% DRY,MEAS.	CO2,% DRY-CALC.	HUMIDITY,#/# - CALC.
HEAT RELEASE,BTU/HR	0.612E 07	96.9	487.0	8.6	11.9	2.50	15.93	0.047
% FUEL AS COAL								
COAL FLOW RATE,#/HR								
NAT.GAS FLOW,#/HR								
% EXCESS AIR								
OXYGEN,% DRY,MEAS.								
CO2,% DRY-CALC.								
HUMIDITY,#/# - CALC.								

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

	KGA,#MOLE/HR-FT2	=	KGA,#MOLE/HR-FT2	=	CONC.,GM-MOLE/L=
KGA,#MOLE/HR-FT2	*****		33.1		0.1432
SULFITE/SO2-MOL/MOL	*****		4.12		13.86
SUMP RESID.TIME,MIN	*****		9.8		2.50
***** MEANS ITEM NOT MEASURED					

	O2 AT FURN.EX.=	O2 AT ABSORB.IN=	O2 AT ABSORB.EX=
O2 AT FURN.EX.=	*****	*****	*****
O2 AT ABSORB.IN=	*****	*****	*****
O2 AT ABSORB.EX=	*****	*****	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-037

DATE 1-21-70

TIME OF DAY 1400

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	18.02			36.04	249.5	5706.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	20.95			*****	268.1	5716.	CARBON 0.492275
							HYDROGEN 0.511644
PART. SCRUBBER							OXYGEN 1.391427
INPUT, #/HR	20.95			*****	3145.	5716.	NITROGEN 5.032768
OUTPUT, #/HR	19.10			*****	3139.	5181.	SULFUR 0.009382

FEED RATE, #/SEC = 1.67

ENTHALPY, BTU/# = 826.

SO2 ABSORBERS

INPUT, #/HR	19.10	GM-MOLE/LITER	11.80	GRAM/100ML	*****	5181.
OUTPUT, #/HR	26.11		16.12		*****	5610.

*

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL, COMBINED FREE	6.03	GM SO2/100ML		MAKEUP MGO COMPOSITION
MONO(TOTAL)	5.06			SLURRY CONC.- GM MGO/100ML = 8.40
MONO(DISSOLVED)	0.97			MGO PRESLAKED, NO=0, YES=1 1
MONO(SOLID)	4.09			% SLAKED TO MG(OH)2, MEAS. = *****
BISULFITE	1.14			
MGO	2.95			PRODUCT MG BASE PHYSICAL PROPERTIES
SULFATE	2.08			ACID STRENGTH, PH = 5.50
MAGNESIUM	0.0			SP.GRAVITY, HYDROM. = 1.0600
FLYASH	0.92			
SOLIDS, MG	5.98			

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.10
FLYASH CONC. GM/100ML = 0.62

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-038	CARD NUMBER	3
DATE	1-21-70	N.G. FLOW,%SCALE	0.9550E 02
TIME	1545	N.G. STATIC,R.O.	0.8100E 01
PRI. AIR ST, HG	0.1600E 01	SCREW SPEED,RPM	0.3800E 03
PRI. AIR DP,H2O	0.2400E 01	O2 FURN.EX,%-BM	0.2500E 01
SEC. AIR ST,HG	0.1600E 01	COMB.FURN,EX,%	0.0
SEC. AIR DP,H2O	0.2300E 01	ELE.CHEM.MILVOLT	0.0
		CELL TEMP,F	0.0
		BAROMETRIC,HG	0.2917E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.8200E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR DRIF.	0.6600E 03	PART.SCRUB.IN	0.5650E 03
ABS NOZ.,PSIG	0.2300E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.3700E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.9620E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8000E 03	PRI.AIR FAN IN.	0.7700E 02
		NO.2 BANK OUT	0.6350E 03	PRI.AIR WGT BULB	0.5350E 02
		FURN. EXIT	0.1250E 03	SEC.AIR FAN IN.	0.2000E 02
		COAL-AIR		SEC.AIR WET BULB	0.2000E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	3	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.9000E 00
PART.SCR.ST,HG	0.3000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.9000E 00
PART.SCR.DP,H2O	0.7200E 01			FBA DP,H2O	0.6500E 01
PART.CYC.DP,H2O	0.5300E 01			FBA DEMIST.DP,H2O	0.1100E 01
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4600E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1360E 03	TEMP.THERMOMETERS,F	0.1440E 03	MAKEUP FLOWS	
#1 ORIFICE	0.1370E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.4054E 05
FBA INLET	0.1320E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.4093E 05
FBA EXIT	0.1310E 03	PART.CYC.SUMP	0.1360E 03	PART.TIME,MIN	0.6600E 02
P.P.EXIT	0.1330E 03	AGS CYC.SUMP	0.0	ABS H2O IN.GAL	0.8413E 04
PART.CYC.SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O FI.GAL	0.8472E 04
ABS CYC.SUMP	0.1320E 03	MGO SLAK TANK	0.7600E 02	ABS H2O TIME,MIN	0.6500E 02
FBA SUMP	0.1320E 03	MGOH2 TANK	0.9200E 02	MGO ROTO.SCALE,%	0.2800E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.2800E 02
MGOH2 TANK	0.9100E 02				
MAKEUP WATER	0.6000E 02				

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	500.	125.0	----	----	----	----	0.004	38.4	498.	21.7
SECONDARY AIR	5022.	646.3	----	----	----	----	0.003	26.7	5009.	11.1
FURNACE EXIT	5984.	635.0	3561.5	*****	*****	*****	0.047	110.2	5716.	5.2
PART.SCRB.INLET	5984.	565.0	*****	*****	*****	*****	0.047	110.2	-----	4.1
PART.CYC.EXIT	5817.	144.0	3501.6	*****	*****	0.0240	0.119	139.0	5197.	-9.5
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN	5817.	137.0	*****	*****	*****	*****	0.119	139.0	-----	-12.2
FLOATING BED EX	6188.	132.0	*****	*****	*****	*****	0.113	135.6	-----	-25.7
P.P. EXIT ORIF.	6188.	131.0	113.4	*****	*****	0.0354	0.113	135.6	5560.	-25.7

SCRUBBER STREAM DATA

RUBBER STREAM DATA			VENTURI ABSORBER			FBA	
	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
PARTICULATE			MAKEUP WATER	****	****	60.0	7.6
MAKEUP WATER	60.0	6.00	MAKEUP MGD SL.	****	4.2	91.0	3.9
PRODUCT LIQ.	136.0	5.09	PRODUCT LIQ.	****	****	134.0	12.0
RECIRCULATED LIQ.	136.0	23.76	REC. (SPRAY NOZ)	****	****	134.0	358.7
			REC. (FLOW NOZ.)	****	****		400.1

FURNACE PERFORMANCE

FURNACE PERFORMANCE
 HEAT RELEASE, BTU/HR
 % FUEL AS COAL
 COAL FLOW RATE, #/HR
 NAT. GAS FLOW, #/HR
 % EXCESS AIR
 OXYGEN, % DRY, MEAS.
 CO₂, % DRY-CALC.
 HUMIDITY, #/# - CALC.

SCRUBBER PERFORMANCE

SCRUBBER PERFORMANCE		PART.
0.612E 07	S02 ABSORB.EFF	1.68
96.9	FLYASH COL.EFF	*****
486.9	S03 ABSORB.EFF	*****
8.7	NOX ABSORB.EFF	*****
11.9	GAS VELOCITY,FPS	158.4
2.50	LIQ/GAS,GAL/MCF	15.1
15.93	LIQ/GAS,#/#	2.0
0.047	PRES.DROP,IN.WG	7.2

VENT ABS.

VENT ABS.	FLOAT-BED
***	96.76
***	-47.67
***	*****
***	*****
***	*****
***	13.3
***	28.1
***	3.9
***	6.5

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA, #MOLE/HR-FT2,	*****	KGA, #MOLE/HR-FT2	=	39.4	CONC., GM-MOLE/L =	0.1224
SULFITE/SO2-MOL/MOL	*****	SULFITE/SO2-MOL/MOL	=	5.93	MOL% TOTAL SULF =	16.06
SUMP RESID.TIME, MIN	*****	SUMP RESID.TIME, MIN	=	9.8	O2 AT FURN. EX. =	2.50
					O2 AT ABSORB. IN =	*****
					O2 AT ABSORB. EX =	*****

****	MEANS	ITEM	NOT	MEASURED
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60
61	62	63	64	65
66	67	68	69	70
71	72	73	74	75
76	77	78	79	80
81	82	83	84	85
86	87	88	89	90
91	92	93	94	95
96	97	98	99	100

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-038

DATE 1-21-70

TIME OF DAY 1545

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	18.02			36.03	249.4	5705.	
OUTPUT, #/HR	21.18			*****	268.1	5716.	
PART. SCRUBBER							
INPUT, #/HR	21.18			*****	3270.	5716.	
OUTPUT, #/HR	18.93			17.52	3169.	5197.	
SO2 ABSORBERS							
INPUT, #/HR	18.93		11.10	0.21	1290.	5197.	
OUTPUT, #/HR	18.76		11.09	*****	1285.	5560.	

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	4.26	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	3.33	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = 7.90
FREE	0.93				MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	2.40				% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	1.00				
MONO(SOLID)	1.40				PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	2.12				ACID STRENGTH, PH = 5.40
MGO	0.0				SP.GRAVITY, HYDROM. = 1.0500
SULFATE	0.78				
MAGNESIUM	4.11				
FLYASH	---				
SOLIDS, MG	---				

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.492246
HYDROGEN	0.510491
OXYGEN	1.391424
NITROGEN	5.032796
SULFUR	0.009380

FEED RATE, #/SEC= 1.67

ENTHALPY, BTU/# = 870.

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.10

FLYASH CONC. GM/100ML = 0.68

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-039	CARD NUMBER	3
DATE	1-21-70	N.G. FLOW, %SCALE	0.8000E 01
TIME	1730	N.G. STATIC, R.O.	0.9500E 02
PRI. AIR ST, HG	0.1600E 01	SCREW SPEED, RPM	0.3800E 03
PRI. AIR DP, H2O	0.2400E 01	O2 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	ELE. CHEM. MILVOLT	0.0
		CELL TFMP, F	0.0
		BARONE, RIC, HG	0.2918E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.8000E 02	PART. SCRUB. IN	0.5750E 03
ABS NOZ., PSIG	0.2300E 02	WINDBOX-TOP	0.6580E 03	#1 ORIFICE	0.1550E 03
ABS LOAD, PSIG	0.3200E 02	WINDBOX-WEST	0.6320E 03	FBA INLET	0.0
ABS ORIF. INCH	0.3700E 01	WINDBOX-BOT.	0.6320E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9750E 03	PRI. AIR FAN IN.	0.7600E 02
		NO.2 BANK OUT	0.8400E 03	PRI. AIR WGT BULB	0.5400E 02
		FURN. EXIT	0.6300E 03	SEC. AIR FAN IN.	0.2000E 02
		COAL-AIR	0.1200E 03	SEC. AIR WET BULB	0.2000E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	3	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 01
PART. SCR. ST, HG	0.3000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
PART. SCR. DP, H2O	0.7500E 01			FBA DP, H2O	0.6400E 01
PART. CYC. DP, H2O	0.5300E 01			FBA DEMIST. DP, H2O	0.1000E 01
#1 ORIF. ST, HG	-0.7000E 00				
#1 ORIF. DP, H2O	0.4600E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1360E 03	PART. CYC. EXIT	0.1460E 03	PART. INIT. GAL	0.4144E 05
FBA INLET	0.1360E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.4150E 05
FBA EXIT	0.1310E 03	PART. CYC. SUMP	0.1380E 03	PART. TIME, MIN	0.8000E 01
P.P. EXIT	0.1300E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.8557E 04
PART. CYC. SUMP	0.1230E 03	FBA SUMP	0.1360E 03	ABS H2O FI. GAL	0.8566E 04
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.9000E 01
FBA SUMP	0.1350E 03	MGOH2 TANK	0.8000E 02	MGO ROTO. SCALE, %	0.1900E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.1900E 02
MGOH2 TANK	0.8100E 02				
MAKEUP WATER	0.5400E 02				

RUN NUMBER D-039

DATE 1-21-70

TIME OF DAY 1730

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	502.	120.0	---	---	---	---	0.005	41.2	500.	21.7
SECONDARY AIR	5032.	641.8	---	---	---	---	0.003	26.7	5019.	11.8
FURNACE EXIT	5997.	630.0	3379.3	---	---	3.5010	0.045	108.7	5741.	5.8
PART.SCRB.INLET	5997.	575.0	---	---	---	---	0.045	108.7	---	4.1
PART.CYC.EXIT	5809.	146.0	3379.3	---	987.	---	0.119	139.0	5190.	-9.5
VENT ABS.INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC.EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	5809.	136.0	---	---	---	---	0.119	139.0	---	---
FLOATING BED EX	6197.	131.0	---	---	---	---	0.112	135.3	---	---
P.P. EXIT ORIF.	6197.	130.0	305.9	---	662.	---	0.112	135.3	5575.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	---	---	---	---	---
MAKEUP WATER	54.0	7.00	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	138.0	5.09	MAKEUP MGO SL.	---	54.0 8.3
RECIRCULATED LIQ.	138.0	23.76	PRODUCT LIQ.	4.2	81.0 3.2
			REC.(SPRAY NOZ)	---	136.0 12.0
			REC.(FLOW NOZ.)	---	136.0 358.7
				---	400.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.606E 07	SCRUBBER PERFORMANCE	VENT ABS.	FLOAT.BED
% FUEL AS COAL	99.7	SO2 ABSORB.EFF	---	90.95
COAL FLOW RATE,#/HR	495.9	FLYASH COL.EFF	---	---
NAT.GAS FLOW,#/HR	0.9	SO3 ABSORB.EFF	---	---
% EXCESS AIR	12.9	NOX ABSORB.EFF	---	32.93
OXYGEN,% DRY, MEAS.	2.70	GAS VELOCITY,FPS	---	13.3
CO2,% DRY-CALC.	15.89	LIQ/GAS,GAL/MCF	---	28.2
HUMIDITY,#/# - CALC.	0.045	LIQ/GAS,#/#	---	3.9
		PRES.DROP,IN.WG	---	6.4

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
SULFITE/SO2-MOL/MOL = *****
SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 27.6
SULFITE/SO2-MOL/MOL = 6.25
SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0669
MOL% TOTAL SULF= 9.67
O2 AT FURN. EX.= 2.70
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-039

DATE 1-21-70

TIME OF DAY 1730

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	18.35	---	---	36.70	254.0	5721.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	20.18	---	---	33.51	256.0	5741.	CARBON 0.492136
PART. SCRUBBER							HYDROGEN 0.491378
INPUT, #/HR	20.18	---	---	33.51	3759.	5741.	OXYGEN 1.392395
OUTPUT, #/HR	18.25	---	---	*****	3167.	5190.	NITROGEN 5.032644
SO2 ABSORBERS							SULFUR 0.009532
INPUT, #/HR	18.25		9.09	*****	1298.	5190.	FEED RATE, #/SEC = 1.67
OUTPUT, #/HR	17.68		7.90	*****	1292.	5575.	ENTHALPY, BTU/# = 947.

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
COMBINED	4.00	0.6252	---
FREE	2.50	0.3908	---
MONO(TOTAL)	1.50	0.2345	---
MONO(DISSOLVED)	1.00	0.1563	---
MONO(SOLID)	1.02	0.1594	1.657
BISULFITE	-0.02	-0.0031	-0.065
MGO	3.00	0.2344	4.359
SULFATE	0.0	0.0	0.0
MAGNESIUM	0.43	0.0669	0.803
FLYASH	2.93	0.4577	---
SOLIDS, MG	---	---	*****
	---	---	0.062

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 7.80
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.30
SP.GRAVITY, HYDROM. = 1.0430

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.40
FLYASH CONC. GM/100ML = 0.57

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-040	CARD NUMBER	2	CARD NUMBER	3
DATE	1-23-70	WINDBOX ST, H2O	0.1320E 02	N.G. FLOW, SCALE	0.9650E 02
TIME	1130	BURNER DP, H2O	0.6800E 01	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5900E 01	SCREW SPEED, RPM	0.3800E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % - BM	0.2800E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.6500E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2879E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F	0.8500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.6500E 03	PART. SCRUB. IN	0.5500E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.3600E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4000E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.9350E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.8000E 03	PRI. AIR FAN IN.	0.7850E 02
		NO. 2 BANK OUT	0.6180E 03	PRI. AIR WGT BULB	0.5650E 02
CARD NUMBER	7	FURN. EXIT	0.1250E 03	SEC. AIR FAN IN.	0.2600E 02
MODE OF OPER.	3	COAL-AIR		SEC. AIR WET BULB	0.2600E 02
PART. SCR. ST, HG	0.4000E 00				
PART. SCR. DP, H2O	0.8100E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5300E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.9000E 00
#1 ORIF. ST, HG	-0.7000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.9000E 00
#1 ORIF. DP, H2O	0.4500E 01			FBA DP, H2O	0.6600E 01
				FBA DEMIST. DP, H2O	0.1100E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1350E 03	TEMP. THERMOMETERS, F	0.1440E 03	MAKEUP FLOWS	
#1 ORIFICE	0.1370E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.4286E 05
FBA INLET	0.1320E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.4288E 05
FBA EXIT	0.1320E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.5000E 01
P.P. EXIT	0.1340E 03	ABS CYC. SUMP	0.1370E 03	ABS H2O IN. GAL	0.1015E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.7600E 02	ABS H2O FI. GAL	0.1016E 05
ABS CYC. SUMP	0.1340E 03	MGO SLAK TANK	0.1020E 03	ABS H2O TIME, MIN	0.5000E 01
FBA SUMP	0.1340E 03	MGOH2 TANK		MGO ROTO. SCALE, %	0.5400E 02
MGO SLAK TANK	0.7800E 02			MAKEUP SETTING	0.5400E 02
MGOH2 TANK	0.1080E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE -

RUN NUMBER D-040 DATE 1-23-70 TIME OF DAY 1130

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	486.	125.0	-----	-----	-----	-----	0.006	45.9	483.	21.7
SECONDARY AIR	4976.	635.0	-----	-----	-----	-----	0.003	32.8	4959.	13.2
FURNACE EXIT	5912.	618.0	3533.4	-----	-----	-----	0.047	110.0	5646.	6.5
PART.SCRB.INLET	5912.	550.0	-----	-----	-----	-----	0.047	110.0	-----	5.4
PART.CYC.EXIT	5728.	144.0	3396.4	-----	870.	-----	0.109	135.5	5166.	-9.5
VENT ABS.INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC.EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	5728.	137.0	-----	-----	-----	-----	0.109	135.5	-----	-12.2
FLOATING BED EX	6151.	132.0	-----	-----	-----	-----	0.104	132.5	-----	-25.7
P.P. EXIT ORIF.	6151.	132.0	28.3	-----	776.	-----	0.104	132.5	5570.	-25.7

SCRUBBER STREAM DATA

PARTICULATE	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	FBA
MAKEUP WATER	60.0	4.60	MAKEUP WATER	-----	-----	60.0
PRODUCT LIQ.	137.0	5.09	MAKEUP MGO SL.	-----	4.2	108.0
RECIRCULATED LIQ.	137.0	23.76	PRODUCT LIQ.	-----	-----	137.0
			REC.(SPRAY NOZ)	-----	-----	137.0
			REC.(FLOW NOZ.)	-----	-----	377.1
				-----	-----	416.0

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.595E 07	SO2 ABSORB.EFF	3.88	VENT ABS.	FLOAT.BED
% FUEL AS COAL	96.8	FLYASH COL.EFF	-----	-----	99.17
COAL FLOW RATE,#/HR	473.1	SO3 ABSORB.EFF	-----	-----	-----
NAT.GAS FLOW,#/HR	8.7	NOX ABSORB.EFF	-----	-----	-----
% EXCESS AIR	13.3	GAS VELOCITY,FPS	157.4	-----	10.82
OXYGEN,% DRY, MEAS.	2.80	LIQ/GAS,GAL/MCF	15.2	-----	13.4
CO2,% DRY-CALC.	15.66	LIQ/GAS,#/#	2.1	-----	29.1
HUMIDITY,#/# - CALC.	0.047	PRES.DROP,IN.WG	8.1	-----	4.1
				-----	6.6

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	KGA,#MOLE/HR-FT2	=	55.1
SULFITE/SO2-MOL/MOL	= <td>SULFITE/SO2-MOL/MOL</td> <td>= <td>6.98</td> </td>	SULFITE/SO2-MOL/MOL	= <td>6.98</td>	6.98
SUMP RESID.TIME,MIN	= <td>SUMP RESID.TIME,MIN</td> <td>= <td>9.8</td> </td>	SUMP RESID.TIME,MIN	= <td>9.8</td>	9.8

CONC.,GM-MOLE/L= 0.0263

MOL% TOTAL SULF= 3.23

O2 AT FURN.EX.= 2.80

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-040

DATE 1-23-70

TIME OF DAY 1130

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 17.51
 OUTPUT, #/HR 20.78
 PART. SCRUBBER
 INPUT, #/HR 20.78
 OUTPUT, #/HR 18.27

SO2 ABSORBERS
 INPUT, #/HR 18.27
 OUTPUT, #/HR 20.44

*SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 5.48
 COMBINED 5.48
 FREE 0.0
 MONO(TOTAL) 5.48
 MONO(DISSOLVED) 1.10
 MONO(SOLID) 4.38
 BISULFITE 0.04
 MGO 0.24
 SULFATE 0.17
 MAGNESIUM 5.89
 FLYASH
 SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

SULFUR MAGNESIUM FLYASH WATER DRY GAS

17.51 35.01 247.1 5636.
 20.78 ***** 265.9 5646.

20.78 ***** 2568. 5646.
 18.27 ***** 3111. 5166.

18.27 17.20 1233. 5166.
 20.44 15.87 1230. 5570.

GM SO2/ 100ML GM-MOLE/ LITER GRAM/ 100ML

5.48 0.8561
 5.48 0.8561
 0.0 0.0
 5.48 0.8561
 1.10 0.1719
 4.38 0.6842
 0.04 0.0031
 0.24 0.0372
 0.17 0.0263
 5.89 0.9196

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 8.20
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 7.00
 SP.GRAVITY, HYDROM. = 1.0650

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = 2.00
 FLYASH CONC. GM/100ML = 0.75

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.484912
 HYDROGEN 0.519227
 OXYGEN 1.392262
 NITROGEN 5.039552
 SULFUR 0.009235

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 389.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-041	CARD NUMBER	2	CARD NUMBER	3
DATE	1-23-70	WINDBOX ST, H2O	0.1300E 02	N.G. FLOW, %SCALE	0.9550E 02
TIME	1300	BURNER DP, H2O	0.7200E 01	N.G. STATIC, R.O.	0.8100E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5700E 01	SCREW SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % - BM	0.2600E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.6100E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2878E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F	0.8500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.6500E 03	PART. SCRUB. IN	0.5600E 03
ABS NOZ., PSIG	0.1100E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.7000E 01	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF. INCH	0.1600E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.9600E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8150E 03	PRI. AIR FAN IN.	0.8300E 02
		NO.2 BANK OUT	0.6350E 03	PRI. AIR WGT BULB	0.5800E 02
CARD NUMBER	7	FURN. EXIT	0.1250E 03	SEC. AIR FAN IN.	0.2500E 02
MODE OF OPER.	3	COAL-AIR		SEC. AIR WGT BULB	0.2500E 02
PART. SCR. ST, HG	0.3500E 00				
PART. SCR. DP, H2O	0.8300E 01				
PART. CYC. DP, H2O	0.5300E 01				
#1 ORIF. ST, HG	-0.6500E 00				
#1 ORIF. DP, H2O	0.4600E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 01
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.9000E 00
		FBA DP, H2O	0.5700E 01
		FBA DEMIST. DP, H2O	0.1100E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1370E 03	TEMP. THERMOMETERS, F	0.1460E 03	MAKEUP FLOWS	
#1 ORIFICE	0.1380E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.4329E 05
FBA INLET	0.1320E 03	ABS CYC. EXIT	0.1400E 03	PART. FINAL, GAL	0.4335E 05
FBA EXIT	0.1320E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.1100E 02
P. P. EXIT	0.1330E 03	ABS CYC. SUMP	0.1370E 03	ABS H2O IN. GAL	0.1022E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.0	ABS H2O FI. GAL	0.1023E 05
ABS CYC. SUMP	0.1330E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.1100E 02
FBA SUMP	0.1330E 03	MGOH2 TANK	0.1080E 03	MGO ROTO. SCALE, %	0.5100E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.5100E 02
MGOH2 TANK	0.1060E 03				
MAKEUP WATER	0.6000E 02				

RUN NUMBER D-041

DATE 1-23-70

TIME OF DAY 1300

FLUE GAS DATA

UNIT	TEMP.	SO2	SO3	NOX	FLYASH	HUM.	DEW	DRY	STAT
	F	PPM	PPM	PPM	GR/DSCF	%	POINT	FLOW	PRES
							F	#/HR	IN. H2O
PRIMARY AIR	125.0					0.006	45.6	483.	21.7
SECONDARY AIR	635.0					0.003	31.8	4959.	13.0
FURNACE EXIT	635.0	3532.2	*****	*****	4.3831	0.047	110.1	5648.	6.1
PART.SCRB.INLET	560.0	*****	*****	*****	*****	0.047	110.1	---	4.7
PART.CYC.EXIT	146.0	3485.7	*****	740.	*****	0.114	137.2	5186.	-8.8
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	138.0	*****	*****	*****	*****	0.114	137.2	---	-13.5
FLOATING BED EX	132.0	*****	*****	*****	*****	0.110	134.3	---	-25.7
P.P. EXIT ORIF.	132.0	71.0	*****	705.	*****	0.110	134.3	5532.	-25.7

SCRUBBER STREAM DATA

RUBBER STREAM DATA			FBA		
PARTICULATE			TEMP,F	FLOW,#/M	FLOW,#/M
MAKEUP WATER	60.0	5.59	***#*	60.0	6.8
PRODUCT LIQ.	140.0	5.09	***#*	106.0	5.6
RECIRCULATED LIQ.	140.0	23.76	***#*	137.0	12.0
GAS ABSORBER			***#*	137.0	217.7
MAKEUP WATER			***#*		263.1
MAKEUP MGO SL.			4.2		
PRODUCT LIQ.			***#*		
REC.(SPRAY NOZ)			***#*		
REC.(FLOW NOZ.)			***#*		

FURNACE PERFORMANCE

[illegible]

SD2 ABSORPTION PARAMETERS

VENTURI ABSORBER

```

      KGA,#MOLE/HR-FT2,
      SULFITE/SO2-MOL/MOL
      SUMP RESID.TIME,MIN
      =
      =
      =
      *****
      *****
      *****
      *****
      *****

```

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	44.5
SULFITE/SO2-MOL/MOL	=	4.02
SUMP RESID.TIME,MIN	=	9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0240
MOL% TOTAL SULF=	3.45
02 AT FURN. EX.=	2.60
02 AT ABSORB.IN=	*****
02 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-041

DATE 1-23-70

TIME OF DAY 1300

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	17.71	---	---	35.41	249.0	5638.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	20.76	---	---	41.29	267.6	5648.	CARBON 0.489805
PART. SCRUBBER							HYDROGEN 0.522622
INPUT, #/HR	20.76	---	---	41.29	3065.	5648.	OXYGEN 1.391704
OUTPUT, #/HR	18.81	---	---	*****	3142.	5186.	NITROGEN 5.035045
SO2 ABSORBERS							SULFUR 0.009332
INPUT, #/HR	18.81	16.54	*****		1312.	5186.	FEED RATE, #/SEC= 1.65
OUTPUT, #/HR	17.53	13.26	*****		1269.	5532.	ENTHALPY, BTU/# = 335.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	4.61	GM SO2 /	GRAM /	MAKEUP MGO COMPOSITION
COMBINED	4.61	100ML	100ML	SLURRY CONC. - GM MGO/100ML = 8.20
FREE	0.0			MGO PRESLAKED, NO=0, YES=1 1
MONO(TOTAL)	4.61			% SLAKED TO MG(OH)2, MEAS. = *****

MONO(DISSOLVED)	1.02			PRODUCT MG BASE PHYSICAL PROPERTIES
MONO(SOLID)	3.59			ACID STRENGTH, PH = 7.30
BISULFITE	0.08			SP.GRAVITY, HYDROM. = 1.0550

MGO	0.15			
SULFATE	0.15			
MAGNESIUM	4.92			
FLYASH	---			
SOLIDS, MG	---			

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

PARTICULATE SCRUBBER PRODUCT	
ACID STRENGTH, PH	= 2.20
FLYASH CONC. GM/100ML	= 0.93

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-042	CARD NUMBER	2	CARD NUMBER	3
DATE	1-23-70	WINDBOX ST,H20	0.1290E 02	N.G. FLOW,%SCALE	0.9600E 02
TIME	1430	BURNER DP,H20	0.7200E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H20	0.5500E 01	SCREW SPEED,RPM	0.4000E 03
PRI.AIR DP,H20	0.2200E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.2800E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H20	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.6500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2879E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4100E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.9000E 02	PART.SCRUB.IN	0.5650E 03
ABS NOZ.,PSIG	0.2500E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.3750E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4300E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9550E 03	PRI.AIR FAN IN.	0.8500E 02
		NO.2 BANK OUT	0.8200E 03	PRI.AIR WGT BULB	0.5900E 02
CARD NUMBER	7	FURN. EXIT	0.6300E 03	SEC.AIR FAN IN.	0.2600E 02
MODE OF OPER.	3	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.2600E 02
PART.SCR.ST,HG	0.4000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H20	0.8200E 01	VENT.ABS.DP,H20	0.0	FBA INLET ST,HG	-0.9000E 00
PART.CYC.DP,H20	0.5300E 01	ABS CYC.DP,H20	0.0	FBA SUMP DP,H20	0.9000E 00
#1 ORIF.ST,HG	-0.7000E 00			FBA DP,H20	0.6600E 01
#1 ORIF.DP,H20	0.4500E 01			FBA DEMIST.DP,H20	0.1100E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.4353E 05
FBA INLET	0.1380E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.4367E 05
FBA EXIT	0.1330E 03	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.2950E 02
P.P.EXIT	0.1340E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1026E 05
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.1370E 03	ABS H2O FI.GAL	0.1028E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.7600E 02	ABS H2O TIME,MIN	0.2950E 02
FBA SUMP	0.1350E 03	MGOH2 TANK	0.1050E 03	MGO ROTO.SCALE,%	0.5300E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.5300E 02
MGOH2 TANK	0.1050E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE

RUN NUMBER	D-042	DATE	1-23-70	TIME OF DAY	1430										
FLUE GAS DATA						FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR						476.	125.0	---	---	---	---	0.006	46.5	473.	21.7
SECONDARY AIR						4953.	640.0	---	---	---	---	0.003	32.8	4936.	12.9
FURNACE EXIT						5875.	630.0	3332.5	*****	*****	*****	0.047	110.0	5611.	6.5
PART.SCRB.INLET						5875.	565.0	*****	*****	*****	*****	0.047	110.0	---	5.4
PART.CYC.EXIT						5735.	142.0	3398.5	*****	*****	0.0365	0.111	136.2	5162.	-9.5
VENT ABS.INLET						*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT						*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN						5735.	138.0	*****	*****	*****	*****	0.111	136.2	---	-12.2
FLOATING BED EX						6138.	133.0	*****	*****	*****	*****	0.106	133.1	---	-25.7
P.P. EXIT ORIF.						6138.	134.0	26.9	*****	*****	0.0302	0.106	133.1	5549.	-25.7

SCRUBBER STREAM DATA

PARTICULATE	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
MAKEUP WATER	60.0	4.54	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	140.0	5.09	MAKEUP MGO SL.	*****	60.0 5.7
RECIRCULATED LIQ.	140.0	23.45	PRODUCT LIQ.	*****	105.0 5.8
			REC.(SPRAY NOZ)	*****	137.0 12.0
			REC.(FLOW NOZ.)	*****	137.0 377.1
				*****	431.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.592E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
% FUEL AS COAL	96.8	S02 ABSORB.EFF	-1.98	*****	99.21
COAL FLOW RATE,#/HR	470.2	FLYASH COL.EFF	*****	*****	17.24
NAT.GAS FLOW,#/HR	8.7	S03 ABSORB.EFF	*****	*****	*****
% EXCESS AIR	13.3	NOX ABSORB.EFF	*****	*****	*****
OXYGEN,% DRY, MEAS.	2.80	GAS VELOCITY,FPS	157.2	*****	13.4
CO2,% DRY-CALC.	15.66	LIQ/GAS,GAL/MCF	15.0	*****	30.2
HUMIDITY,#/# - CALC.	0.047	LIQ/GAS,#/#	2.0	*****	4.2
		PRES.DROP,IN.WG	8.2	*****	6.6

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER			FLOATING BED ABSORBER			SULFATE FORMATION PARAMETERS		
KGA, #MOLE/HR-FT2,	=	*****	KGA, #MOLE/HR-FT2	=	55.5	CONC.,GM-MOLE/L=	0.0141	
SULFITE/SO2-MOL/MOL	=	*****	SULFITE/SO2-MOL/MOL	=	7.26	MOL% TOTAL SULF=	2.04	
SUMP RESID.TIME,MIN	=	*****	SUMP RESID.TIME,MIN	=	9.8	O2 AT FURN. EX.=	2.80	
***** MEANS ITEM NOT MEASURED						O2 AT ABSORB.IN=	*****	
						O2 AT ABSORB.EX=	*****	

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-042

DATE 1-23-70

TIME OF DAY 1430

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	17.40	---	---	34.80	245.6	5601.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	19.47	---	---	*****	264.3	5611.	CARBON	0.484909
PART. SCRUBBER		19.47	---	*****	2537.	5611.	HYDROGEN	0.520395
INPUT, #/HR	18.27	---	---	25.58	3122.	5162.	OXYGEN	1.392262
OUTPUT, #/HR							NITROGEN	5.039555
							SULFUR	0.009235

SO2 ABSORBERS

INPUT, #/HR	18.27	16.98	0.31	1229.	5162.	FEED RATE, #/SEC=	1.64
OUTPUT, #/HR	17.25	13.72	*****	1248.	5549.	ENTHALPY, BTU/# =	519.

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION	
TOTAL,	4.67	0.7301	---	SLURRY CONC.- GM MGO/100ML =	8.20
COMBINED	4.67	0.7301	---	MGO PRESLAKED, NO=0, YES=1	0
FREE	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. =	*****
MONO(TOTAL)	4.67	0.7301	---	PRODUCT MG BASE PHYSICAL PROPERTIES	
MONO(DISSOLVED)	1.10	0.1719	1.787	ACID STRENGTH, PH =	7.50
MONO(SOLID)	3.57	0.5582	11.835	SP.GRAVITY, HYDROM. =	1.0530
BISULFITE	0.0	0.0	0.0	PARTICULATE SCRUBBER PRODUCT	
MGO	0.32	0.0507	0.203	ACID STRENGTH, PH =	2.20
SULFATE	0.09	0.0141	0.169	FLYASH CONC. GM/100ML =	0.99
MAGNESIUM	5.09	0.7949	---		
FLYASH	---	---	*****		
SOLIDS, MG	---	---	14.307		

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-043	CARD NUMBER	2	CARD NUMBER	3
DATE	1-23-70	WINDBOX ST, H2O	0.1280E 02	N.G. FLOW, %SCALE	0.9600E 02
TIME	1550	BURNER DP, H2O	0.7200E 01	N.G. STATIC, R.O.	0.8100E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5500E 01	SCREW SPEED, RPM	0.3900E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.6900E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2810E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F	0.9000E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.6550E 03	PART. SCRUB. IN	0.5700E 03
ABS NOZ., PSIG	0.1100E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1550E 03
ABS LOAD, PSIG	0.8000E 01	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF. INCH	0.1600E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9550E 03	PRI. AIR FAN IN.	0.8200E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8000E 03	PRI. AIR WGT BULB	0.5700E 02
MODE OF OPER.	3	FURN. EXIT	0.6300E 03	SEC. AIR FAN IN.	0.2300E 02
PART. SCR. ST, HG	0.4000E 00	COAL-AIR	0.1250E 03	SEC. AIR WET BULB	0.2300E 02
PART. SCR. DP, H2O	0.8100E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5400E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 01
#1 ORIF. ST, HG	-0.7000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 ORIF. DP, H2O	0.4500E 01			FBA DP, H2O	0.5700E 01
				FBA DEMIST. DP, H2O	0.1100E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART. CYC. EXIT	0.1420E 03	PART. INIT. GAL	0.4388E 05
FBA INLET	0.1370E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.4406E 05
FBA EXIT	0.1330E 03	PART. CYC. SUMP	0.1380E 03	PART. TIME, MIN	0.4100E 02
P.P. EXIT	0.1340E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1031E 05
PART. CYC. SUMP	0.1350E 03	FBA SUMP	0.1380E 03	ABS H2O FI. GAL	0.1034E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.7800E 02	ABS H2O TIME, MIN	0.4200E 02
FBA SUMP	0.1350E 03	MGOH2 TANK	0.1020E 03	MGO ROTO. SCALE, %	0.5200E 02
MGO SLAK TANK	0.7800E 02			MAKEUP SETTING	0.5200E 02
MGOH2 TANK	0.1030E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-043

DATE 1-23-70

TIME OF DAY 1550

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	125.0	---	---	---	---	0.005	44.4	488.	21.7
SECONDARY AIR	4897.	643.8	---	---	---	---	0.003	29.8	4882.	12.8
FURNACE EXIT	5834.	630.0	3413.6	---	---	---	0.047	109.1	5572.	6.9
PART.SCRB.INLET	5834.	570.0	3365.7	---	---	---	0.047	109.1	---	5.4
PART.CYC.EXIT	5662.	142.0	---	---	---	---	0.113	135.7	5088.	-9.5
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5662.	137.0	*****	*****	*****	*****	0.113	135.7	---	-13.5
FLOATING BED EX	6059.	133.0	*****	*****	*****	*****	0.107	132.3	---	-25.7
P.P. EXIT ORIF.	6059.	134.0	61.0	*****	*****	0.0167	0.107	132.3	5474.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	4.56	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	138.0	5.09	MAKEUP MGO SL.	*****	60.0 6.1
PRODUCT LIQ.	138.0	23.76	PRODUCT LIQ.	4.2	103.0 5.7
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	*****	138.0 12.0
			REC.(FLOW NOZ.)	*****	138.0 217.7
				*****	263.1

FURNACE PERFORMANCE

	0.590E 07	96.8	469.5	8.6	12.9	2.70	15.75	0.047
HEAT RELEASE,BTU/HR								
% FUEL AS COAL								
COAL FLOW RATE,#/HR								
NAT.GAS FLOW,#/HR								
% EXCESS AIR								
OXYGEN,% DRY, MEAS.								
CO2,% DRY-CALC.								
HUMIDITY,#/# - CALC.								

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 45.4

SULFITE/SO2-MOL/MOL = 4.45

SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0284

MOL% TOTAL SULF= 4.69

O2 AT FURN.EX.= 2.70

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-043

DATE 1-23-70

TIME OF DAY 1550

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	17.37	---	---	34.74	243.5	5562.
OUTPUT, #/HR	19.80	---	---	*****	262.0	5572.
PART. SCRUBBER		19.80	---	*****	2544.	5572.
INPUT, #/HR	17.83	---	---	23.83	3123.	5088.
OUTPUT, #/HR	17.83	---	---	---	---	---

SO2 ABSORBERS

INPUT, #/HR	17.83	16.97	0.20	1250.	5088.
OUTPUT, #/HR	15.18	12.29	*****	1251.	5474.

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	3.95	0.6170	---	---	---
COMBINED	3.95	0.6170	---	---	---
FREE	0.0	0.0	---	---	---
MONO(TOTAL)	3.95	0.6170	---	---	---
MONO(DISSOLVED)	1.08	0.1687	1.755	---	---
MONO(SOLID)	2.87	0.4482	9.502	---	---
BISULFITE	0.0	0.0	0.0	---	---
MGO	0.43	0.0667	0.267	---	---
SULFATE	0.18	0.0284	0.341	---	---
MAGNESIUM	4.56	0.7121	---	---	---
FLYASH	---	---	*****	---	---
SOLIDS, MG	---	---	11.884	---	---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED	
CARBON	0.487350
HYDROGEN	0.519342
OXYGEN	1.391981
NITROGEN	5.037307
SULFUR	0.009283

FEED RATE, #/SEC = 1.62

ENTHALPY, BTU/# = 654.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	8.30
MGO PRESLAKED, NO=0, YES=1	0
% SLAKED TO MG(OH)2, MEAS. =	76.50

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	7.80
SP.GRAVITY, HYDROM. =	1.0430

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	2.30
FLYASH CONC. GM/100ML =	0.93

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-044	CARD NUMBER	2	CARD NUMBER	3
DATE	1-26-70	WINDBOX ST, H2O	0.1180E 02	N.G. FLOW, %SCALE	0.9850E 02
TIME	1015	BURNER DP, H2O	0.6600E 01	N.G. STATIC, R.O.	0.8300E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5000E 01	SCREW SPEED, RPM	0.3900E 03
PRI. AIR DP, H2O	0.2100E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5200E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.6900E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2876E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.9000E 02	PART. SCRUB. IN	0.5650E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX - TOP	0.4600E 03	#1 ORIFICE	0.1550E 03
ABS LOAD, PSIG	0.4000E 02	WINDBOX - WEST	0.4400E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4300E 01	WINDBOX - BOT.	0.4400E 03	AIR HEATER #1	0.1000E 03
ABSORBER NOZ. CODE	1	WINDBOX - EAST	0.4500E 03	AIR HEATER #2	0.9200E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.9250E 03	PRI. AIR FAN IN.	0.8450E 02
		NO. 2 BANK OUT	0.8020E 03	PRI. AIR WGT BULB	0.6150E 02
CARD NUMBER	7	FURN. EXIT	0.6250E 03	SEC. AIR FAN IN.	0.3250E 02
MODE OF OPER.	3	COAL - AIR	0.1250E 03	SEC. AIR WET BULB	0.3200E 02
PART. SCR. ST, HG	0.3500E 00				
PART. SCR. DP, H2O	0.7300E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5400E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.8500E 00
#1 ORIF. ST, HG	-0.6000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.8000E 00
#1 ORIF. DP, H2O	0.4500E 01			FBA DP, H2O	0.6600E 01
				FBA DEMIST. DP, H2O	0.1150E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART. CYC. EXIT	0.1460E 03	PART. INIT. GAL	0.4482E 05
FBA INLET	0.1370E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.4505E 05
FBA EXIT	0.1330E 03	PART. CYC. SUMP	0.1380E 03	PART. TIME, MIN	0.4000E 02
P. P. EXIT	0.1320E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1052E 05
PART. CYC. SUMP	0.1340E 03	FBA SUMP	0.1360E 03	ABS H2O FI. GAL	0.1055E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.4000E 02
FBA SUMP	0.1320E 03	MGOH2 TANK	0.7800E 02	MGO ROTO. SCALE, %	0.5300E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5300E 02
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-044

DATE 1-26-70

TIME OF DAY 1015

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	464.	125.0	---	---	---	---	0.007	53.3	461.	21.7
SECONDARY AIR	4950.	447.5	---	---	---	---	0.004	38.3	4929.	11.8
FURNACE EXIT	5861.	625.0	3107.5	---	---	4.1559	0.048	110.8	5591.	6.9
PART.SCRB.INLET	5861.	565.0	---	---	---	---	0.048	110.8	---	4.7
PART.CYC.EXIT	5714.	146.0	3282.4	---	---	0.0145	0.117	138.0	5114.	-8.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5714.	137.0	*****	*****	*****	*****	0.117	138.0	---	-11.5
FLOATING BED EX	6080.	133.0	*****	*****	*****	*****	0.111	134.4	---	-25.7
P.P. EXIT ORIF.	6080.	132.0	24.2	*****	*****	0.0266	0.111	134.4	5473.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.62	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	138.0	5.09	MAKEUP MGO SL.	*****	60.0 6.2
RECIRCULATED LIQ.	138.0	23.76	PRODUCT LIQ.	4.2	78.0 5.8
			REC.(SPRAY NOZ)	*****	136.0 12.0
			REC.(FLOW NOZ.)	*****	136.0 377.1
				*****	431.3

FURNACE PERFORMANCE

	0.593E 07	96.7	470.7	8.9	12.9	2.70	15.74	0.048
HEAT RELEASE,BTU/HR								
% FUEL AS COAL								
COAL FLOW RATE,#/HR								
NAT.GAS FLOW,#/HR								
% EXCESS AIR								
OXYGEN,% DRY, MEAS.								
CO2,% DRY-CALC.								
HUMIDITY,#/# - CALC.								

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER		FLOATING BED ABSORBER	
KGA,#MOLE/HR-FT2,	*****	KGA,#MOLE/HR-FT2	*****
SULFITE/SO2-MOL/MOL	*****	SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****	SUMP RESID.TIME,MIN	*****
***** MEANS ITEM NOT MEASURED		***** MEANS ITEM NOT MEASURED	

SULFATE FORMATION PARAMETERS

VENTURI ABSORBER		FLOATING BED ABSORBER	
CONC.,GM-MOLE/L=	0.0333	CONC.,GM-MOLE/L=	0.0333
MOL% TOTAL SULF=	5.03	MOL% TOTAL SULF=	5.03
O2 AT FURN.EX.=	2.70	O2 AT FURN.EX.=	2.70
O2 AT ABSORB.IN=	*****	O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****	O2 AT ABSORB.EX=	*****

TIME OF DAY 1015

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE

INPUT FLOWS, #ATOMS/100#FEED

INPUT, #/HR
OUTPUT, #/HR

CARBON 0.487166

OUTPUT, #/HR

HYDROGEN 0.539892

PART. SCRUBBER

RT-SCRUBBER

INPUT, #/HR

3084. 5591.

SO₂ ABSORBERS

2 ABSORBERS

INPUT, #/HR

1287. 5114.

* *S02 ABSORBERS-
PRODUCT COMP.

GM SD2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGD/100ML = 7.90

MGO PRESLAKED, NO=0, YES=1 0

2 SLAKED TO MG(OH)2, MEAS. = *****

**FREE
MONO(TOTAL)
MONO(DISSOLVED)**

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.20

SP.GRAVITY, HYDROM. = 1.0500

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.40

FLYASH CONC. GM/100ML = 1.04

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

OXY+NIT 0.0817

SULFUR	0.0370
--------	--------

ASH 0.0740

WATER	0.0438
-------	--------

* * * SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-045	CARD NUMBER	2	CARD NUMBER	3
DATE	1-26-70	WINDBOX ST,H20	0.1150E 02	N.G. FLOW,%SCALE	0.9850E 02
TIME	1215	BURNER DP,H20	0.6800E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H20	0.5700E 01	SCREW SPEED,RPM	0.3800E 03
PRI.AIR DP,H20	0.2100E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.2500E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H20	0.5200E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.6900E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2876E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.4550E 03	PART.SCRUB.IN	0.5800E 03
ABS NOZ.,PSIG	0.1100E 02	WINDBOX-TOP	0.4400E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.9000E 01	WINDBOX-WEST	0.4400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.1500E 01	WINDBOX-BOT.	0.4500E 03	AIR HEATER #1	0.1000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.9500E 03	AIR HEATER #2	0.9200E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8250E 03	PRI.AIR FAN IN.	0.8200E 02
		NO.2 BANK OUT	0.6420E 03	PRI.AIR WGT BULB	0.6000E 02
CARD NUMBER	7	FURN. EXIT	0.1250E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	3	COAL-AIR		SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.4000E 00				
PART.SCR.DP,H20	0.7600E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H20	0.5500E 01	VENT.ABS.DP,H20	0.0	FBA INLET ST,HG	-0.9000E 00
#1 ORIF.ST,HG	-0.6000E 00	ABS CYC.DP,H20	0.0	FBA SUMP DP,H20	0.1000E 01
#1 ORIF.DP,H20	0.4500E 01			FBA DP,H20	0.5700E 01
				FBA DEMIST.DP,H20	0.1100E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1450E 03	PART.INIT.GAL	0.4546E 05
FBA INLET	0.1380E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.4561E 05
FBA EXIT	0.1330E 03	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.3300E 02
P.P.EXIT	0.1330E 03	ABS CYC.SUMP	0.0	ABS H20 IN.GAL	0.1061E 05
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.1380E 03	ABS H20 FI.GAL	0.1064E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.0	ABS H20 TIME,MIN	0.3300E 02
FBA SUMP	0.1330E 03	MGOH2 TANK	0.7600E 02	MGO ROTO.SCALE,%	0.5200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5200E 02
MGOH2 TANK	0.7900E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-045

DATE 1-26-70

TIME OF DAY 1215

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	464.	125.0	---	---	---	---	0.007	51.7	461.	21.7
SECONDARY AIR	4927.	446.3	---	---	---	---	0.004	39.0	4906.	11.5
FURNACE EXIT	5841.	642.0	3068.6	---	---	---	0.049	111.1	5570.	6.9
PART.SCRB.INLET	5841.	580.0	---	---	---	---	0.049	111.1	---	5.4
PART.CYC.EXIT	5723.	145.0	3031.2	---	---	---	0.116	137.6	5129.	-8.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	0.116	137.6	---	*****
FLOATING BED IN	5723.	138.0	*****	*****	*****	*****	0.110	134.2	---	-12.2
FLOATING BED EX	6078.	133.0	*****	*****	*****	*****	0.110	134.2	---	-25.7
P.P. EXIT ORIF.	6078.	133.0	63.9	*****	*****	*****	0.110	134.2	5475.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE			MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	60.0	4.61	MAKEUP MGO SL.	*****	60.0 7.3
PRODUCT LIQ.	140.0	5.09	PRODUCT LIQ.	4.2	79.0 5.7
RECIRCULATED LIQ.	140.0	23.76	REC.(SPRAY NOZ)	*****	138.0 12.0
			REC.(FLOW NOZ.)	*****	138.0 217.7
				*****	254.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.596E 07
% FUEL AS COAL	96.7
COAL FLOW RATE,#/HR	473.8
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	11.9
OXYGEN,% DRY, MEAS.	2.50
CO2,% DRY-CALC.	15.92
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.22
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	157.5
LIQ/GAS,GAL/MCF	15.2
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	7.6

VENT ABS.

VENT ABS.	*****
*****	97.89
*****	*****
*****	*****
*****	*****
*****	13.3
*****	18.0
*****	2.5
*****	5.7

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 43.6

SULFITE/SO2-MOL/MOL = 5.32

SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0382

MOL% TOTAL SULF= 6.91

O2 AT FURN. EX.= 2.50

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-045

DATE 1-26-70

TIME OF DAY 1215

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	17.53			35.06	252.2	5560.	
OUTPUT, #/HR	17.78			*****	271.4	5570.	
PART. SCRUBBER							
INPUT, #/HR	17.78			*****	2576.	5570.	
OUTPUT, #/HR	16.18			*****	3142.	5129.	

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

16.18
13.75

16.15
10.74

1347.
1275.

5129.
5475.

FEED RATE, #/SEC = 1.62

ENTHALPY, BTU/# = -4536.

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.90
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

3.48
3.48
0.0
3.48
1.20
2.28
0.0
0.25
0.24
3.98

0.5443
0.5443
0.0
0.5443
0.1875
0.3568
0.0
0.0396
0.0382
0.6220

1.950
7.563
0.0
0.158
0.458

9.754

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.40
SP.GRAVITY, HYDROM. = 1.0450

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.30
FLYASH CONC. GM/100ML = 0.90

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-046	CARD NUMBER	2	CARD NUMBER	3
DATE	1-26-70	WINDBOX ST,H2O	0.1180E 02	N.G. FLOW,%SCALE	0.9850E 02
TIME	1350	BURNER DP,H2O	0.6900E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.5000E 01	SCREW SPEED,RPM	0.3800E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.2500E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.6500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2877E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.4500E 03	PART.SCRUB.IN	0.5700E 03
ABS NOZ.,PSIG	0.2500E 02	WINDBOX-TOP	0.4350E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4400E 02	WINDBOX-WEST	0.4350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4300E 01	WINDBOX-BOT.	0.4350E 03	AIR HEATER #1	0.1000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.4420E 03	AIR HEATER #2	0.9200E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9500E 03	PRI.AIR FAN IN.	0.8200E 02
		NO.2 BANK OUT	0.8100E 03	PRI.AIR WGT BULB	0.6050E 02
		FURN. EXIT	0.6350E 03	SEC.AIR FAN IN.	0.3200E 02
		COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.3200E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	3	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	0.8000E 00
PART.SCR.ST,HG	0.4000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1000E 01
PART.SCR.DP,H2O	0.7300E 01			FBA DP,H2O	0.6500E 01
PART.CYC.DP,H2O	0.5300E 01			FBA DEMIST.DP,H2O	0.1100E 01
#1 ORIF.ST,HG	-0.6000E 00				
#1 ORIF.DP,H2O	0.4500E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1450E 03	PART.INIT.GAL	0.4588E 05
FBA INLET	0.1360E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.4599E 05
FBA EXIT	0.1320E 03	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.2500E 02
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1067E 05
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.1380E 03	ABS H2O FI.GAL	0.1069E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.2500E 02
FBA SUMP	0.1320E 03	MGOH2 TANK	0.8600E 02	MGO ROTO.SCALE,%	0.5300E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5300E 02
MGOH2 TANK	0.9100E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-046

DATE 1-26-70

TIME OF DAY 1350

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	475.	125.0	---	---	---	---	0.007	52.9	472.	21.7
SECONDARY AIR	4950.	440.5	---	---	---	---	0.004	38.9	4929.	11.8
FURNACE EXIT	5878.	635.0	3248.7	---	---	---	0.049	111.1	5605.	6.5
PART.SCRB.INLET	5878.	570.0	---	---	---	---	0.049	111.1	---	5.4
PART.CYC.EXIT	5727.	145.0	3142.4	---	---	---	0.114	137.0	5142.	-8.1
VENT ABS.INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC.EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	5727.	136.0	---	---	---	---	0.114	137.0	---	10.8
FLOATING BED EX	6147.	132.0	---	---	---	---	0.107	133.3	---	-25.7
P.P. EXIT ORIF.	6147.	132.0	24.3	---	---	---	0.107	133.3	5553.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	4.60	---	---	---
MAKEUP WATER	140.0	5.09	---	---	---
PRODUCT LIQ.	140.0	23.76	---	---	---
RECIRCULATED LIQ.	---	---	---	---	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.600E 07
% FUEL AS COAL	96.7
COAL FLOW RATE,#/HR	476.9
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	11.9
OXYGEN,% DRY, MEAS.	2.50
CO2,% DRY-CALC.	15.92
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	3.27
FLYASH COL.EFF	---
SO3 ABSORB.EFF	---
NOX ABSORB.EFF	---
GAS VELOCITY,FPS	157.4
LIQ/GAS,GAL/MCF	15.2
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	7.3

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 55.7
 SULFITE/SO2-MOL/MOL = 9.56
 SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0353
 MOL% TOTAL SULF= 4.72
 O2 AT FURN.EX.= 2.50
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-046

DATE 1-26-70

TIME OF DAY 1350

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	17.64	---	---	35.29	254.0	5595.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	18.95	---	---	*****	273.2	5605.	CARBON 0.492003
							HYDROGEN 0.542964
PART. SCRUBBER							OXYGEN 1.391403
INPUT, #/HR	18.95	---	---	*****	2575.	5605.	NITROGEN 5.033031
OUTPUT, #/HR	16.81	---	---	*****	3133.	5142.	SULFUR 0.009367

SO2 ABSORBERS	FEED RATE, #/SEC= 1.64
INPUT, #/HR	
OUTPUT, #/HR	
	ENTHALPY, BTU/# = -4691.

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = 7.90
FREE	4.95	0.7738	---	MGO PRESLAKED, NO=0, YES=1 1
	4.95	0.7738	---	% SLAKED TO MG(OH)2, MEAS. = *****
	0.0	0.0	---	
MONO(TOTAL)	4.95	0.7738	---	
MONO(DISSOLVED)	1.34	0.2094	---	
MONO(SOLID)	3.61	0.5645	2.177	
BISULFITE	0.0	0.0	11.967	
MGO	0.19	0.0304	0.0	
SULFATE	0.23	0.0353	0.122	
MAGNESIUM	5.37	0.8395	0.423	
FLYASH	---	---	---	
SOLIDS, MG	---	---	*****	
			14.082	

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	= 7.00
SP.GRAVITY, HYDROM.	= 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	= 2.10
FLYASH CONC. GM/100ML	= 0.90

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	D-047	CARD NUMBER	3
DATE	1-26-70	N.G. FLOW,%SCALE	0.9850E 02
TIME	1515	N.G. STATIC,R.O.	0.8300E 01
PRI. AIR ST, HG	0.1600E 01	SCREW SPEED,RPM	0.3800E 03
PRI. AIR DP,H2O	0.2200E 01	D2 FURN.EX.%-BM	0.2600E 01
SEC. AIR ST, HG	0.1600E 01	COMB.FURN.EX.%	0.0
SEC. AIR DP,H2O	0.2300E 01	ELE.CHEM.MILVOLT	0.0
		CELL TEMP,F	0.0
		BAROMETRIC,HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	PART.SCRUB.IN	0.5750E 03
ABS NOZ.,PSIG	0.1100E 02	#1 DRIFICE	0.1450E 03
ABS LOAD,PSIG	0.1000E 02	FBA INLET	0.0
ABS ORIF.INCH	0.1600E 01	AIR HEATER #1	0.1000E 03
ABSORBER NOZ. CODE	1	AIR HEATER #2	0.9150E 03
MANOMETER CODE	0	PRI. AIR FAN IN.	0.8250E 02
		PRI. AIR WGT BULB	0.6000E 02
CARD NUMBER	7	SEC. AIR FAN IN.	0.3300E 02
MODE OF OPER.	3	SEC. AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.4000E 00		
PART.SCR.DP,H2O	0.7300E 01		
PART.CYC.DP,H2O	0.5300E 01		
#1 ORIF.ST,HG	-0.6000E 00		
#1 ORIF.DP,H2O	0.4500E 01		

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.9000E 00
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1100E 01
		FBA DP,H2O	0.5700E 01
		FBA DEMIST.DP,H2O	0.1100E 01

CARD NUMBER	10	CARD NUMBER	12
TEMP.PILOT RECORDER,F		MAKEUP FLOWS	
#1 ORIFICE	0.1380E 03	PART.INIT.GAL	0.4640E 05
FBA INLET	0.1390E 03	PART.FINAL,GAL	0.4653E 05
FBA EXIT	0.1320E 03	PART.TIME,MIN	0.3000E 02
P.P.EXIT	0.1340E 03	ABS H2O IN.GAL	0.1074E 05
PART.CYC.SUMP	0.1360E 03	ABS H2O FI.GAL	0.1076E 05
ABS CYC.SUMP	0.0	ABS H2O TIME,MIN	0.3000E 02
FBA SUMP	0.1350E 03	MGO ROTO.SCALE,%	0.5200E 02
MGO SLAK TANK	0.0	MAKEUP SETTING	0.5200E 02
MGOH2 TANK	0.9400E 02		
MAKEUP WATER	0.6000E 02		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER D-047

DATE 1-26-70

TIME OF DAY 1515

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	476.	125.0	---	---	---	---	0.007	51.3	472.	21.7
SECONDARY AIR	4956.	436.2	---	---	---	---	0.004	37.7	4935.	11.9
FURNACE EXIT	5882.	635.0	3266.3	---	---	3.7586	0.048	110.9	5611.	6.9
PART.SCRB.INLET	5882.	575.0	---	---	---	---	0.048	110.9	---	5.4
PART.CYC.EXIT	5732.	145.0	3184.4	---	---	0.0159	0.114	137.2	5146.	-8.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5732.	139.0	*****	*****	*****	*****	0.114	137.2	---	-12.2
FLOATING BED EX	6141.	132.0	*****	*****	*****	*****	0.108	133.7	---	-25.7
P.P. EXIT ORIF.	6141.	134.0	77.0	*****	*****	0.0179	0.108	133.7	5542.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE				TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	60.0	4.50	MAKEUP WATER	*****	60.0
PRODUCT LIQ.	140.0	5.09	MAKEUP MGO SL.	4.2	94.0
RECIRCULATED LIQ.	140.0	23.76	PRODUCT LIQ.	*****	138.0
			REC.(SPRAY NOZ.)	*****	138.0
			REC.(FLOW NOZ.)	*****	217.7
				*****	263.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.598E 07
% FUEL AS COAL	96.7
COAL FLOW RATE,#/HR	474.9
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	12.4
OXYGEN,% DRY, MEAS.	2.60
CO2,% DRY-CALC.	15.83
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	2.51
FLYASH COL.EFF	99.58
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	157.3
LIQ/GAS,GAL/MCF	15.2
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	7.3

VENT ABS.

FLOAT.BED

97.58
-12.38

13.4
18.5
2.6
5.7

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 42.6
 SULFITE/SO2-MOL/MOL = 4.47
 SUMP RESID.TIME,MIN = 9.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0357
 MOL% TOTAL SULF= 4.59
 O2 AT FURN. EX.= 2.60
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER D-047

DATE 1-26-70

TIME OF DAY 1515

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE					
INPUT, #/HR	17.57	---	35.14	251.8	5602.
OUTPUT, #/HR	19.08	---	35.18	271.0	5611.
PART. SCRUBBER					
INPUT, #/HR	19.08	---	35.18	2523.	5611.
OUTPUT, #/HR	17.06	---	22.65	3135.	5146.

FEED RATE, #/SEC = 1.64

SO2 ABSORBERS

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
INPUT, #/HR	17.06	16.15	0.14
OUTPUT, #/HR	19.54	13.94	*****

*SO2 ABSORBERS-
PRODUCT COMP.

MAKEUP MGO COMPOSITION

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	5.09	0.7955	---
COMBINED	4.94	0.7721	---
FREE	0.15	0.0234	---
MONO(TOTAL)	4.79	0.7487	---
MONO(DISSOLVED)	1.04	0.1625	1.690
MONO(SOLID)	3.75	0.5862	12.427
BISULFITE	0.68	0.0531	0.988
MGO	0.0	0.0	0.0
SULFATE	0.23	0.0357	0.428
MAGNESIUM	5.17	0.8078	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	11.998

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

ENTHALPY, BTU/# = -4610.

SLURRY CONC. - GM MGO/100ML = 7.90

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.50

SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.10

FLYASH CONC. GM/100ML = 0.88

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-048	CARD NUMBER	2	CARD NUMBER	3
DATE	2-2-70	WINDBOX ST, H2O	0.9900E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1150	BURNER DP, H2O	0.6600E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.3200E 01	SCREW SPEED, RPM	0.3400E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % - BM	0.2400E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.4600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.4500E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2837E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F	0.1050E 03	TEMP. CONTINUED	0.5650E 03
PART. LOAD, PSIG	0.4250E 02	SEC. AIR ORIF.	0.6650E 03	PART. SCRUB. IN	0.1550E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6450E 03	#1 ORIFICE	0.0
ABS LOAD, PSIG	0.3400E 02	WINDBOX-WEST	0.6450E 03	FBA INLET	0.7000E 03
ABS ORIF. INCH	0.4300E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.9700E 03	AIR HEATER #2	0.7500E 02
MANOMETER CODE	0	NO. 1 BANK OUT	0.8100E 03	PRI. AIR FAN IN.	0.5950E 02
		NO. 2 BANK OUT	0.6400E 03	PRI. AIR WGT BULB	0.4750E 02
		FURN. EXIT	0.1150E 03	SEC. AIR FAN IN.	0.4550E 02
		COAL-AIR		SEC. AIR WGT BULB	

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	2	VENT. ABS. DP, H2O	0.1400E 01	FBA INLET ST, HG	0.0
PART. SCR. ST, HG	0.1500E 00	ABS CYC. DP, H2O	0.6200E 01	FBA SUMP DP, H2O	0.0
PART. SCR. DP, H2O	0.6000E 01			FBA DP, H2O	0.0
PART. CYC. DP, H2O	0.5600E 01			FBA DEMIST. DP, H2O	0.0
#1 ORIF. ST, HG	-0.7000E 00				
#1 ORIF. DP, H2O	0.4500E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1380E 03	TEMP. THERMOMETERS, F	0.1400E 03	MAKEUP FLOWS	0.4755E 05
#1 ORIFICE	0.6000E 02	PART. CYC. EXIT	0.1360E 03	PART. INIT. GAL	0.4775E 05
FBA INLET	0.6000E 02	ABS CYC. EXIT	0.1400E 03	PART. FINAL, GAL	0.4250E 02
FBA EXIT	0.1350E 03	PART. CYC. SUMP	0.1280E 03	PART. TIME, MIN	0.1105E 05
P.P. EXIT	0.1350E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1108E 05
PART. CYC. SUMP	0.1270E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.4250E 02
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.8200E 02	ABS H2O TIME, MIN	0.4900E 02
FBA SUMP	0.7800E 02	MGOH2 TANK		MGO ROTO. SCALE, %	0.4900E 02
MGO SLAK TANK	0.9100E 02			MAKEUP SETTING	0.4900E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER	E-048	DATE 2-2-70	TIME OF DAY 1150
FLUE GAS DATA			
PRIMARY AIR	497.	115.0	493.
SECONDARY AIR	4848.	651.3	4815.
FURNACE EXIT	5793.	640.0	5510.
PART.SCRB.INLET	5793.	565.0	---
PART.CYC.EXIT	5694.	140.0	---
VENT ABS.INLET	5694.	140.0	---
ABS CYC.EXIT	5664.	136.0	---
FLOATING BED IN	---	---	---
FLOATING BED EX	---	---	---
P.P. EXIT ORIF.	5664.	135.0	5096.

SCRUBBER STREAM DATA	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/M	VENTURI ABSORBER	TEMP, F	FLOW, #/M	FBA
PARTICULATE	60.0	4.75	MAKEUP WATER	60.0	5.3	TEMP, F	60.0	5.3	5.3
MAKEUP WATER	140.0	5.03	MAKEUP MGO SL.	91.0	5.5	FLOW, #/M	91.0	5.5	5.5
PRODUCT LIQ.	140.0	23.76	PRODUCT LIQ.	128.0	12.0	TEMP, F	128.0	12.0	12.0
RECIRCULATED LIQ.	---	---	REC.(SPRAY NOZ)	128.0	504.0	FLOW, #/M	128.0	504.0	504.0
	---	---	REC.(FLOW NOZ.)	431.3	431.3		431.3	431.3	431.3

FURNACE PERFORMANCE	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/M	VENTURI ABSORBER	TEMP, F	FLOW, #/M	FBA
HEAT RELEASE, BTU/HR	0.593E 07	4.75	MAKEUP WATER	60.0	5.3	TEMP, F	60.0	5.3	5.3
% FUEL AS COAL	96.7	5.03	MAKEUP MGO SL.	91.0	5.5	FLOW, #/M	91.0	5.5	5.5
COAL FLOW RATE, #/HR	471.2	23.76	PRODUCT LIQ.	128.0	12.0	TEMP, F	128.0	12.0	12.0
NAT.GAS FLOW, #/HR	8.8	---	REC.(SPRAY NOZ)	128.0	504.0	FLOW, #/M	128.0	504.0	504.0
% EXCESS AIR	11.4	---	REC.(FLOW NOZ.)	431.3	431.3		431.3	431.3	431.3
OXYGEN, % DRY, MEAS.	2.40	---							
CO2, % DRY-CALC.	16.00	---							
HUMIDITY, #/# - CALC.	0.051	---							

S02 ABSORPTION PARAMETERS	VENTURI ABSORBER	FLOATING BED ABSORBER	SULFATE FORMATION PARAMETERS
KGA, #MOLE/HR-FT2,	99.2	KGA, #MOLE/HR-FT2	CONC., GM-MOLE/L=
SULFITE/SO2-MOL/MOL	7.75	SULFITE/SO2-MOL/MOL	MOL% TOTAL SULF=
SUMP RESID.TIME, MIN	11.0	SUMP RESID.TIME, MIN	O2 AT FURN. EX.=
			O2 AT ABSORB.IN=
			O2 AT ABSORB.EX=

**** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER E-048

DATE 2-2-70

TIME OF DAY 1150

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	17.43			34.87	263.8	5500.
OUTPUT, #/HR	18.21			*****	282.7	5510.
PART. SCRUBBER						
INPUT, #/HR	18.21			*****	2661.	5510.
OUTPUT, #/HR	17.40			*****	3113.	5096.

SO2 ABSORBERS	
INPUT, #/HR	17.40
OUTPUT, #/HR	21.60

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	4.69
COMBINED	4.46
FREE	0.23
MONO(TOTAL)	4.23
MONO(DISSOLVED)	1.04
MONO(SOLID)	3.19
BISULFITE	0.76
MGO	0.0
SULFATE	0.37
MAGNESIUM	4.83
FLYASH	-----
SOLIDS, MG	-----

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.60
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.50
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.60
FLYASH CONC. GM/100ML = 0.93

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.494382
HYDROGEN 0.555216
OXYGEN 1.391119
NITROGEN 5.030843
SULFUR 0.009413

FEED RATE, #/SEC= 1.61

ENTHALPY, BTU/# = -1269.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-049	CARD NUMBER	2	CARD NUMBER	3
DATE	2-2-70	WINDBOX ST,H2O	0.9800E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1430	BURNER DP,H2O	0.6700E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.3100E 01	SCREW SPEED,RPM	0.3400E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.2500E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.4200E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.5100E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2836E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4250E 02	SEC.AIR ORIF.	0.1150E 03	PART.SCRUB.IN	0.5750E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6550E 03	#1 DRIFICE	0.1550E 03
ABS LOAD,PSIG	0.2850E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4500E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9650E 03	PRI.AIR FAN IN.	0.8100E 02
		NO.2 BANK OUT	0.8200E 03	PRI.AIR WGT BULB	0.6400E 02
CARD NUMBER	7	FURN. EXIT	0.6450E 03	SEC.AIR FAN IN.	0.4400E 02
MODE OF OPER.	2	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.4400E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5600E 01	VENT.ABS.DP,H2O	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7000E 00	ABS CYC.DP,H2O	0.5100E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4500E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1380E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.4841E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1390E 03	PART.FINAL,GAL	0.4854E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1380E 03	PART.TIME,MIN	0.3400E 02
P.P.EXIT	0.1330E 03	ABS CYC.SUMP	0.1380E 03	ABS H2O IN.GAL	0.1127E 05
PART.CYC.SUMP	0.1330E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1129E 05
ABS CYC.SUMP	0.1330E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.3400E 02
FBA SUMP	0.0	MGOH2 TANK	0.8700E 02	MGO ROTO.SCALE,%	0.3700E 02
MGO SLAK TANK	0.8000E 02			MAKEUP SETTING	0.3700E 02
MGOH2 TANK	0.8600E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	484.	120.0	---	---	---	---	0.010	61.1	479.	21.7
SECONDARY AIR	4805.	642.5	---	---	---	---	0.007	51.2	4772.	9.8
FURNACE EXIT	5730.	645.0	3163.3	---	---	4.3739	0.051	112.1	5450.	5.1
PART.SCRB.INLET	5730.	575.0	-----	-----	-----	-----	0.051	112.1	-----	2.7
PART.CYC.EXIT	5685.	142.0	3304.1	-----	-----	0.0104	0.116	137.0	5094.	-9.5
VENT ABS.INLET	5685.	142.0	-----	-----	-----	-----	0.116	137.0	-----	-14.0
ABS CYC.EXIT	5426.	139.0	-----	-----	-----	-----	0.107	132.7	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	5426.	133.0	885.8	-----	-----	0.0171	0.107	132.7	4903.	-25.7

SCRUBBER STREAM DATA

PARTICULATE	TEMP,F	FLOW,GPM
MAKEUP WATER	60.0	3.91
PRODUCT LIQ.	138.0	4.99
RECIRCULATED LIQ.	138.0	23.76

VENTURI ABSORBER	TEMP,F	FLOW,#/M	FBA
TEMP,F	60.0	3.7	-----
MAKEUP WATER	86.0	4.6	-----
MAKEUP MGO SL.	138.0	12.0	-----
PRODUCT LIQ.	138.0	504.0	-----
REC.(SPRAY NOZ)	138.0	441.2	-----
REC.(FLOW NOZ.)	-----	-----	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,% DRY, MEAS.	CO2,% DRY-CALC.	HUMIDITY,#/# - CALC.
0.584E 07	96.7	463.5	8.8	11.9	2.50	15.92	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	FLYASH COL.EFF	SO3 ABSORB.EFF	NOX ABSORB.EFF	GAS VELOCITY,FPS	LIQ/GAS,GAL/MCF	LIQ/GAS,#/#	PRES.DROP,IN.WG
-4.45	99.76	-----	-----	158.6	15.1	2.1	6.2

VENT ABS.	TEMP,F	FLOW,#/M	FBA
73.19	60.0	3.7	-----
-64.03	86.0	4.6	-----
-----	138.0	12.0	-----
-----	138.0	504.0	-----
-----	138.0	441.2	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	77.4
SULFITE/SO2-MOL/MOL	=	8.49
SUMP RESID.TIME,MIN	=	11.0

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	-----
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	-----

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0258
MOL% TOTAL SULF=	2.60
O2 AT FURN.EX.=	2.50
O2 AT ABSORB.IN=	-----
O2 AT ABSORB.EX=	-----

**** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER E-049

DATE 2-2-70

TIME OF DAY 1430

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	17.15	-----	-----	34.30	260.6	5441.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	17.94	-----	-----	39.75	279.5	5450.	CARBON	0.491915
							HYDROGEN	0.569975
							OXYGEN	1.391397
							NITROGEN	5.033118
							SULFUR	0.009363
PART. SCRUBBER							FEED RATE, #/SEC=	1.59
INPUT, #/HR	17.94	-----	-----	39.75	2237.	5450.		
OUTPUT, #/HR	17.51	-----	-----	23.01	3089.	5094.	ENTHALPY, BTU/# =	-1468.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

17.51
29.01
12.66
16.08

0.09
0.14

5094.
4903.

* SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML
GM-MOLE/
LITER

1065.
1160.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.70
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 5.70
SP.GRAVITY, HYDROM. = 1.0700

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.90
FLYASH CONC. GM/100ML = 0.92

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-050	CARD NUMBER	2	CARD NUMBER	3
DATE	2-2-70	WINDBOX ST,H2O	0.1110E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	1630	BURNER DP,H2O	0.7000E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.3900E 01	SCREW SPEED,RPM	0.3450E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.2600E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.3800E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX.ST,H2O	0.5200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2836E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.1100E 03	PART.SCRUB.IN	0.5800E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1580E 03
ABS LOAD,PSIG	0.2850E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4100E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9750E 03	PRI.AIR FAN IN.	0.8600E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8150E 03	PRI.AIR WGT BULB	0.6450E 02
MODE OF OPER.	2	FURN. EXIT	0.6450E 03	SEC.AIR FAN IN.	0.4200E 02
PART.SCR.ST,HG	0.3000E 00	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.4150E 02
PART.SCR.DP,H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5500E 01	VENT.ABS.DP,H2O	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.6000E 00	ABS CYC.DP,H2O	0.5100E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.4898E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1400E 03	PART.FINAL,GAL	0.4910E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.2600E 02
P.P.EXIT	0.1340E 03	ABS CYC.SUMP	0.1380E 03	ABS H2O IN.GAL	0.1137E 05
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1138E 05
ABS CYC.SUMP	0.1350E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.2600E 02
FBA SUMP	0.0	MGOH2 TANK	0.8800E 02	MGO ROTO.SCALE,%	0.1900E 02
MGO SLAK TANK	0.8000E 02			MAKEUP SETTING	0.1900E 02
MGOH2 TANK	0.9800E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER	E-050	DATE 2-2-70		TIME OF DAY 1630							
FLUE GAS DATA		FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR		482.	125.0	-----	-----	-----	-----	0.009	59.1	478.	21.7
SECONDARY AIR		4931.	643.8	-----	-----	-----	-----	0.006	48.2	4900.	11.1
FURNACE EXIT		5862.	645.0	3774.4	*****	*****	*****	0.050	111.5	5581.	5.2
PART.SCRB.INLET		5862.	580.0	*****	*****	*****	*****	0.050	111.5	-----	4.1
PART.CYC.EXIT		5627.	142.0	3696.2	*****	770.	*****	0.119	138.0	5028.	-8.1
VENT ABS.INLET		5627.	142.0	*****	*****	*****	*****	0.119	138.0	-----	-12.5
ABS CYC.EXIT		5155.	140.0	*****	*****	*****	*****	0.108	133.0	-----	-25.7
FLOATING BED IN		*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX		*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.		5155.	134.0	1150.3	*****	802.	*****	0.108	133.0	4653.	-25.7

SCRUBBER STREAM DATA

PARTICULATE				VENTURI ABSORBER				FBA			
	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
MAKEUP WATER	60.0	4.62	MAKEUP WATER	60.0	2.6	*****	*****	*****	*****	*****	*****
PRODUCT LIQ.	140.0	5.03	MAKEUP MGO SL.	98.0	3.2	*****	*****	*****	*****	*****	*****
RECIRCULATED LIQ.	140.0	23.76	PRODUCT LIQ.	138.0	12.0	*****	*****	*****	*****	*****	*****
			REC.(SPRAY NOZ)	138.0	504.0	*****	*****	*****	*****	*****	*****
			REC.(FLOW NOZ.)		421.2	*****	*****	*****	*****	*****	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.594E 07
% FUEL AS COAL	96.7
COAL FLOW RATE,#/HR	472.4
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	12.4
OXYGEN,%DRY,MEAS.	2.60
CO2,%DRY-CALC.	15.83
HUMIDITY,#/# - CALC.	0.050

SCRUBBER PERFORMANCE

S02 ABSORB.EFF	2.07
FLYASH COL.EFF	*****
S03 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	156.7
LIQ/GAS,GAL/MCF	15.3
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.2

VENT ABS.

68.88

FLOAT.BED

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	65.2
SULFITE/S02-MOL/MOL	=	8.20
SUMP RESID.TIME,MIN	=	11.0

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/S02-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0266
MOL% TOTAL SULF=	2.95
O2 AT FURN. EX.=	2.60
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER E-050

DATE 2-2-70

TIME OF DAY 1630

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	17.48	---	---	34.96	261.9	5571.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	21.92	---	---	*****	280.8	5581.	CARBON	0.489635
							HYDROGEN	0.560286
PART. SCRUBBER							OXYGEN	1.391689
INPUT, #/HR	21.92	---	---	*****	2590.	5581.	NITROGEN	5.035211
OUTPUT, #/HR	19.34	---	---	*****	3114.	5028.	SULFUR	0.009323

SO2 ABSORBERS							FEED RATE, #/SEC=	1.63
INPUT, #/HR	19.34		8.50	*****	933.	5028.	ENTHALPY, BTU/# =	-971.
OUTPUT, #/HR	26.99		11.96	*****	1148.	4653.		

*SO2 ABSORBERS- PRODUCT COMP.	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGD COMPOSITION	
TOTAL,	5.80	0.9055	---	SLURRY CONC.- GM MGD/100ML =	7.30
COMBINED	4.26	0.6662	---	MGD PRESLAKED, NO=0, YES=1	0
FREE	1.53	0.2393	---	% SLAKED TO MG(OH)2, MEAS. =	*****

MONO(TOTAL)	2.73	0.4269	---	PRODUCT MG BASE PHYSICAL PROPERTIES	
MONO(DISSOLVED)	1.16	0.1812	---	ACID STRENGTH, PH =	5.20
MONO(SOLID)	1.57	0.2457	---	SP.GRAVITY, HYDROM. =	1.0600
BISULFITE	3.56	0.2781	---		
MGO	0.0	0.0	---		

SULFATE	0.17	0.0266	---	PARTICULATE SCRUBBER PRODUCT	
MAGNESIUM	4.43	0.6928	---	ACID STRENGTH, PH =	2.60
FLYASH	---	---	---	FLYASH CONC. GM/100ML =	0.87
SOLIDS, MG	---	---	---		

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-051	CARD NUMBER	2	CARD NUMBER	3
DATE	2-4-70	WINDBOX ST, H2O	0.1120E 02	N.G. FLOW, %SCALE	0.9500E 02
TIME	1100	BURNER DP, H2O	0.5600E 01	N.G. STATIC, R.O.	0.8300E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5600E 01	SCREW SPEED, RPM	0.3700E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % BM	0.2800E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.4900E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2907E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.7000E 02	PART. SCRUB. IN	0.5650E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1450E 03
ABS LOAD, PSIG	0.2850E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4300E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.9650E 03	PRI. AIR FAN IN.	0.7200E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.8250E 03	PRI. AIR WGT BULB	0.4950E 02
MODE OF OPER.	2	FURN. EXIT	0.6400E 03	SEC. AIR FAN IN.	0.0
PART. SCR. ST, HG	0.2500E 00	COAL-AIR	0.1150E 03	SEC. AIR WET BULB	0.0
PART. SCR. DP, H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5600E 01	VENT. ABS. DP, H2O	0.1800E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.7000E 00	ABS CYC. DP, H2O	0.5400E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4800E 01			FBA DP, H2O	0.0
				FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1380E 03	PART. CYC. EXIT	0.1400E 03	PART. INIT. GAL	0.5116E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1380E 03	PART. FINAL, GAL	0.5130E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1400E 03	PART. TIME, MIN	0.2950E 02
P. P. EXIT	0.1320E 03	ABS CYC. SUMP	0.1350E 03	ABS H2O IN. GAL	0.1183E 05
PART. CYC. SUMP	0.1340E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1186E 05
ABS CYC. SUMP	0.1300E 03	MGO SUMP	0.0	ABS H2O TIME, MIN	0.2950E 02
FBA SUMP	0.6000E 02	MGO SLAK TANK	0.0	MGO ROTO. SCALE, %	0.9000E 01
MGO SLAK TANK	0.6000E 02	MGOH2 TANK	0.6400E 02	MAKEUP SETTING	0.9000E 01
MGOH2 TANK	0.6200E 02				
MAKEUP WATER	0.5200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER E-051

DATE 2-4-70

TIME OF DAY 1100

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	504.	115.0	---	---	---	---	0.003	31.5	502.	21.7
SECONDARY AIR	5073.	637.5	---	---	---	---	0.001	6.4	5067.	11.2
FURNACE EXIT	6036.	640.0	3933.2	---	---	---	0.045	108.6	5777.	4.9
PART.SCRB.INLET	6036.	565.0	---	---	---	---	0.045	108.6	---	3.4
PART.CYC.EXIT	5966.	140.0	3683.4	---	738.	---	0.109	135.8	5382.	-9.5
VENT ABS.INLET	5966.	140.0	---	---	---	---	0.109	135.8	---	-14.3
ABS CYC.EXIT	6192.	138.0	---	---	---	---	0.099	131.4	---	-25.7
FLOATING BED IN	*****	*****	---	---	---	---	*****	*****	---	*****
FLOATING BED EX	*****	*****	---	---	---	---	*****	*****	---	*****
P.P. EXIT ORIF.	6192.	132.0	1364.2	---	696.	---	0.099	131.4	5632.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	52.0	4.75	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	140.0	5.03	MAKEUP MGO SL.	8.2	*****
RECIRCULATED LIQ.	140.0	23.76	PRODUCT LIQ.	2.5	*****
			REC.(SPRAY NOZ)	12.0	*****
			REC.(FLOW NOZ.)	504.0	*****
				431.3	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.609E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	484.6
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	13.3
OXYGEN,% DRY, MEAS.	2.80
CO2,% DRY-CALC.	15.67
HUMIDITY,#/# - CALC.	0.045

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	6.35
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	161.2
LIQ/GAS,GAL/MCF	14.9
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.2

VENT ABS.

62.96

5.68
81.8
30.1
4.2
1.8

PART.

6.35

161.2
14.9
2.0
6.2

VENTURI ABSORBER

SO2 ABSORB.EFF	6.35
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	161.2
LIQ/GAS,GAL/MCF	14.9
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.2

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.609E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	484.6
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	13.3
OXYGEN,% DRY, MEAS.	2.80
CO2,% DRY-CALC.	15.67
HUMIDITY,#/# - CALC.	0.045

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	67.2
SULFITE/SO2-MOL/MOL	=	4.56
SUMP RESID.TIME,MIN	=	2.8

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0315
MOL% TOTAL SULF=	5.25
O2 AT FURN. EX.=	2.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER E-051

DATE 2-4-70

TIME OF DAY 1100

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	17.93	---	---	35.86	240.3	5767.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	23.67	---	---	*****	258.8	5777.	CARBON	0.485090
							HYDROGEN	0.493758
							OXYGEN	1.392277
							NITROGEN	5.039378
							SULFUR	0.009244

FEED RATE, #/SEC = 1.68

ENTHALPY, BTU/# = 1574.

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	3.64	0.5689	---
COMBINED	2.14	0.3345	---
FREE	1.50	0.2344	---
MONO(TOTAL)	0.64	0.1000	---
MONO(DISSOLVED)	0.76	0.1188	1.235
MONO(SOLID)	-0.12	-0.0187	-0.397
BISULFITE	2.60	0.2031	3.778
MGO	0.0	0.0	0.0
SULFATE	0.20	0.0315	0.378
MAGNESIUM	2.34	0.3660	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	0.039

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.80
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 5.10
SP.GRAVITY, HYDROM. = 1.0330

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.50
FLYASH CONC. GM/100ML = 0.90

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-052	CARD NUMBER	3
DATE	2-4-70	N.G. FLOW, %SCALE	0.9500E 02
TIME	1415	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1600E 01	SCREW SPEED, RPM	0.3900E 03
PRI. AIR DP, H2O	0.2400E 01	02 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2903E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.7500E 02	PART. SCRUB. IN	0.5850E 03
ABS NOZ., PSIG	0.1000E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.1000E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.2100E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1015E 04	PRI. AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.8700E 03	PRI. AIR WGT BULB	0.5100E 02
CARD NUMBER	7	FURN. EXIT	0.6650E 03	SEC. AIR FAN IN.	0.0
MODE OF OPER.	2	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.0
PART. SCR. ST, HG	0.3000E 00				
PART. SCR. DP, H2O	0.6300E 01				
PART. CYC. DP, H2O	0.5600E 01				
#1 ORIF. ST, HG	-0.6500E 00				
#1 ORIF. DP, H2O	0.4600E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.1500E 01	FBA INLET ST, HG	0.0
ABS CYC. DP, H2O	0.4800E 01	FBA SUMP DP, H2O	0.0
		FBA DP, H2O	0.0
		FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART. CYC. EXIT	0.1420E 03	PART. INIT. GAL	0.5216E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1400E 03	PART. FINAL, GAL	0.5239E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1400E 03	PART. TIME, MIN	0.4500E 02
P.P. EXIT	0.1350E 03	ABS CYC. SUMP	0.1380E 03	ABS H2O IN. GAL	0.1197E 05
PART. CYC. SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1198E 05
ABS CYC. SUMP	0.1350E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.4500E 02
FBA SUMP	0.0	MGOH2 TANK	0.6800E 02	MGO ROTO. SCALE, %	0.5200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5200E 02
MGOH2 TANK	0.6700E 02				
MAKEUP WATER	0.5200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE

RUN NUMBER E-052

DATE 2-4-70

TIME OF DAY 1415

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	501.	120.0	---	---	---	---	0.004	34.0	499.	21.7
SECONDARY AIR	5046.	640.0	---	---	---	---	0.001	6.4	5040.	11.1
FURNACE EXIT	6007.	665.0	3524.3	---	---	---	0.045	108.8	5748.	5.3
PART. SCRUB. INLET	6007.	585.0	-----	-----	-----	-----	0.045	108.8	-----	4.1
PART. CYC. EXIT	5825.	142.0	3481.5	-----	749.	-----	0.114	137.3	5230.	-8.8
VENT ABS. INLET	5825.	142.0	-----	-----	-----	-----	0.114	137.3	-----	-13.4
ABS CYC. EXIT	6167.	140.0	-----	-----	-----	-----	0.103	132.4	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	6167.	135.0	843.1	-----	774.	-----	0.103	132.4	5592.	-25.7

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	TEMP, F	VENTURI ABSORBER TEMP, F	FBA TEMP, F	FLOW, #/M
PARTICULATE	52.0	4.98	---	52.0	1.5	---	-----
MAKEUP WATER	140.0	5.03	MAKEUP MGO SL.	67.0	5.7	---	-----
PRODUCT LIQ.	140.0	23.76	PRODUCT LIQ.	138.0	12.0	---	-----
RECIRCULATED LIQ.	---	---	REC. (SPRAY NOZ)	138.0	308.6	---	-----
---	---	---	REC. (FLOW NOZ.)	301.4	---	---	-----

FURNACE PERFORMANCE

	HEAT RELEASE, BTU/HR	% FUEL AS COAL	COAL FLOW RATE, #/HR	NAT. GAS FLOW, #/HR	% EXCESS AIR	OXYGEN, % DRY, MEAS.	CO2, % DRY-CALC.	HUMIDITY, #/# - CALC.	SCRUBBER PERFORMANCE	VENT ABS.	FLOAT. BED
	0.609E 07	96.9	484.6	8.6	12.9	2.70	15.75	0.045	SO2 ABSORB. EFF	75.78	-----
									FLYASH COL. EFF	-----	-----
									SO3 ABSORB. EFF	-----	-----
									NOX ABSORB. EFF	-3.40	-----
									GAS VELOCITY, FPS	82.0	-----
									LIQ/GAS, GAL/MCF	21.0	-----
									LIQ/GAS, #/#	2.9	-----
									PRES. DROP, IN. WG	1.5	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FI2,	=	95.2	KGA, #MOLE/HR-FI2	=	-----
SULFITE/SO2-MOL/MOL	=	5.18	SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID. TIME, MIN	=	2.8	SUMP RESID. TIME, MIN	=	-----

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0758
MOL% TOTAL SULF=	8.56
O2 AT FURN. EX.=	2.70
O2 AT ABSORB. IN=	-----
O2 AT ABSORB. EX=	-----

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER E-052 DATE 2-4-70 TIME OF DAY 1415

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	17.93	---	35.86	240.4	5737.
OUTPUT, #/HR	21.09	---	*****	259.0	5748.
PART. SCRUBBER					
INPUT, #/HR	21.09	---	*****	2750.	5748.
OUTPUT, #/HR	18.96	---	*****	3109.	5230.
SO2 ABSORBERS					
INPUT, #/HR	18.96	15.94	*****	998.	5230.
OUTPUT, #/HR	27.09	17.31	*****	1214.	5592.

FEED RATE, #/SEC= 1.68

ENTHALPY, BTU/# = 1565.

* *SO2 ABSORBERS-PRODUCT COMP.

	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
TOTAL,	5.69	0.8898	---
COMBINED	5.69	0.8898	---
FREE	0.0	0.0	---
MONO(TOTAL)	5.69	0.8898	---
MONO(DISSOLVED)	1.16	0.1812	1.885
MONO(SOLID)	4.53	0.7086	15.021
BISULFITE	0.28	0.0219	0.407
MGO	0.24	0.0375	0.150
SULFATE	0.48	0.0758	0.909
MAGNESIUM	6.42	1.0031	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	15.854

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.80

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 8.40

SP.GRAVITY, HYDROM. = 1.0650

PARTICULATE SCRUBBER; PRODUCT

ACID STRENGTH, PH = 2.40

FLYASH CONC. GM/100ML = 0.80

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-053	CARD NUMBER	2	CARD NUMBER	3
DATE	2-4-70	WINDBOX ST,H2O	0.1120E 02	N.G. FLOW,%SCALE	0.9550E 02
TIME	1620	BURNER DP,H2O	0.5400E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.5700E 01	SCREW SPEED,RPM	0.3800E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX,%-BM	0.2600E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.5200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BARGMETRIC,HG	0.2903E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.8000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.6000E 03
ABS NOZ.,PSIG	0.1000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.1000E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.2200E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1070E 04	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9150E 03	PRI.AIR FAN IN.	0.7400E 02
CARD NUMBER	7	NO.2 BANK OUT	0.6850E 03	PRI.AIR WGT BULB	0.5100E 02
MODE OF OPER.	2	FURN. EXIT	0.1200E 03	SEC.AIR FAN IN.	0.0
PART.SCR.ST,HG	0.3000E 00	COAL-AIR		SEC.AIR WET BULB	0.0
PART.SCR.DP,H2O	0.6300E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5600E 01	VENT.ABS.DP,H2O	0.1500E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.6500E 00	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4500E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1430E 03	PART.INIT.GAL	0.5276E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1420E 03	PART.FINAL,GAL	0.5293E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1420E 03	PART.TIME,MIN	0.3670E 02
P.P.EXIT	0.1340E 03	ABS CYC.SUMP	0.1400E 03	ABS H2O IN.GAL	0.1201E 05
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1202E 05
ABS CYC.SUMP	0.1350E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.3670E 02
FBA SUMP	0.0	MGOH2 TANK	0.7000E 02	MGO ROTO.SCALE,%	0.3600E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.3600E 02
MGOH2 TANK	0.7400E 02				
MAKEUP WATER	0.5200E 02				

RUN NUMBER E-053

DATE 2-4-70

TIME OF DAY 1620

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	491.	120.0	-----	-----	-----	-----	0.004	34.0	489.	21.7
SECONDARY AIR	5022.	640.0	-----	-----	-----	-----	0.001	6.4	5016.	11.2
FURNACE EXIT	5972.	685.0	3971.5	-----	-----	3.0133	0.045	108.9	5713.	5.2
PART.SCRB.INLET	5972.	600.0	-----	-----	-----	-----	0.045	108.9	-----	4.1
PART.CYC.EXIT	5755.	143.0	3964.7	-----	-----	0.0172	0.115	137.8	5160.	-8.8
VENT ABS.INLET	5755.	143.0	-----	-----	-----	-----	0.115	137.8	-----	-13.3
ABS CYC.EXIT	6171.	142.0	-----	-----	-----	-----	0.104	132.8	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	6171.	134.0	1013.2	*****	*****	0.0216	0.104	132.8	5590.	-25.7

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP, F	FLOW, #/M
PARTICULATE	52.0	4.74	MAKEUP WATER	TEMP, F	52.0	2.7
MAKEUP WATER	142.0	5.03	MAKEUP MGO SL.	TEMP, F	74.0	4.5
PRODUCT LIQ.	142.0	23.76	PRODUCT LIQ.	TEMP, F	140.0	12.0
RECIRCULATED LIQ.			REC. (SPRAY NOZ)	TEMP, F	140.0	308.6
			REC. (FLOW NOZ.)	TEMP, F	308.5	308.5

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.608E 07
% FUEL AS COAL	96.9
COAL FLOW RATE, #/HR	484.2
NAT. GAS FLOW, #/HR	8.7
% EXCESS AIR	12.4
OX/GEN, % DRY, MEAS.	2.60
CO2, % DRY-CALC.	15.84
HUMIDITY, #/# - CALC.	0.045

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	91.5
SULFITE/SO2-MOL/MOL	=	4.42
SUMP RESID.TIME, MIN	=	2.8

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	0.17
FLYASH COL.EFF	99.43
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY, FPS	156.7
LIQ/GAS, GAL/MCF	15.3
LIQ/GAS, #/#	2.1
PRES.DROP, IN.WG	6.3

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME, MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0719
MOL% TOTAL SULF=	7.12
O2 AT FURN. EX.=	2.60
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

FLOAT.BED

VENT ABS.

74.44
-25.27

82.4
21.4
3.0
1.5

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	E-053	DATE	2-4-70	TIME OF DAY	1620	INPUT FOR EQ. - KIN.PROG.	
MATERIAL BALANCES						INPUT FLOWS, #ATOMS/100#FEED	
FURNACE						CARBON	0.489840
INPUT, #/HR						HYDROGEN	0.501893
OUTPUT, #/HR						OXYGEN	1.391706
PART. SCRUBBER						NITROGEN	5.035010
INPUT, #/HR						SULFUR	0.009334
OUTPUT, #/HR						FEED RATE, #/SEC =	1.67
SO2 ABSORBERS						ENTHALPY, BTU/# =	1522.
INPUT, #/HR							
OUTPUT, #/HR							
*SO2 ABSORBERS-PRODUCT COMP.						MAKEUP MGO COMPOSITION	
						SLURRY CONC.- GM MGO/100ML =	7.80
						MGO PRESLAKED, NO=0, YES=1	0
						% SLAKED TO MG(OH)2, MEAS. =	*****
						PRODUCT MG BASE PHYSICAL PROPERTIES	
						ACID STRENGTH, PH =	5.80
						SP.GRAVITY, HYDROM. =	1.0650
						PARTICULATE SCRUBBER PRODUCT	
						ACID STRENGTH, PH =	2.40
						FLYASH CONC. GM/100ML =	0.87

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-054	CARD NUMBER	2	CARD NUMBER	3
DATE	2-6-70	WINDBOX ST,H2O	0.1080E 02	N.G. FLOW,SCALE	0.9400E 02
TIME	1100	BURNER DP,H2O	0.6400E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.4400E 01	SCREW SPEED,RPM	0.3500E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX,%-BM	0.2600E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX,ST,H2O	0.4800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2941E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F	0.1000E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR ORIF.	0.6650E 03	PART.SCRUB.IN	0.6050E 03
ABS NOZ.,PSIG	0.1000E 02	WINDBOX-TOP	0.6400E 03	#1 ORIFICE	0.1600E 03
ABS LOAD,PSIG	0.1000E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.1900E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7050E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6550E 03	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1015E 04	PRI.AIR FAN IN.	0.8400E 02
		NO.2 BANK OUT	0.8500E 03	PRI.AIR WGT BULB	0.5850E 02
CARD NUMBER	7	FURN. EXIT	0.6550E 03	SEC.AIR FAN IN.	0.3400E 02
MODE OF OPER.	2	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.3150E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6100E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5700E 01	VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7000E 00	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4700E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1420E 03	TEMP.THERMOMETERS,F	0.1480E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1440E 03	PART.INIT.GAL	0.5502E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1440E 03	PART.FINAL,GAL	0.5520E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.3600E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1221E 05
PART.CYC.SUMP	0.1360E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1224E 05
ABS CYC.SUMP	0.1360E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.3600E 02
FBA SUMP	0.0	MGOH2 TANK	0.7000E 02	MGO ROTO.SCALE,%	0.1800E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1800E 02
MGOH2 TANK	0.6700E 02				
MAKEUP WATER	0.5200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE

RUN NUMBER E-054		DATE 2-6-70		TIME OF DAY 1100							
FLUE GAS DATA		FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR		502.	125.0	---	---	---	---	0.005	45.5	499.	21.7
SECONDARY AIR		4958.	650.0	---	---	---	---	0.004	35.0	4940.	10.8
FURNACE EXIT		5914.	655.0	4262.4	*****	*****	4.1968	0.048	111.0	5645.	4.8
PART.SCRB.INLET		5914.	605.0	*****	*****	*****	*****	0.048	111.0	---	2.7
PART.CYC.EXIT		5886.	148.0	4338.2	*****	*****	0.0155	0.118	139.0	5265.	-9.5
VENT ABS.INLET		5886.	148.0	*****	*****	*****	*****	0.118	139.0	---	-14.2
ABS CYC.EXIT		6196.	144.0	*****	*****	*****	*****	0.108	134.6	---	-25.7
FLOATING BED IN		*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX		*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.		6196.	136.0	1482.5	*****	*****	0.0214	0.108	134.6	5591.	-25.7

SCRUBBER STREAM DATA		TEMP,F	FLOW,GPM	VENTURI ABSORBER		TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE		52.0	5.00	GAS ABSORBER		52.0	6.1	-FBA	
MAKEUP WATER		144.0	5.03	MAKEUP WATER		67.0	3.2	*****	
PRODUCT LIQ.		144.0	23.76	MAKEUP MGO SL.		140.0	12.0	*****	
RECIRCULATED LIQ.				PRODUCT LIQ.		140.0	308.6	*****	
				REC.(SPRAY NOZ)		286.7		*****	
				REC.(FLOW NOZ.)				*****	

FURNACE PERFORMANCE		SCRUBBER PERFORMANCE		VENT ABS.		FLOAT.BED	
HEAT RELEASE,BTU/HR		SO2 ABSORB.EFF		-1.78		*****	
% FUEL AS COAL		FLYASH COL.EFF		99.63		*****	
COAL FLOW RATE,#/HR		SO3 ABSORB.EFF		*****		*****	
NAT.GAS FLOW,#/HR		NOX ABSORB.EFF		*****		*****	
% EXCESS AIR		GAS VELOCITY,FPS		160.0		*****	
OXYGEN,%DRY,MEAS.		LIQ/GAS,GAL/MCF		15.0		*****	
CO2,%DRY-CALC.		LIQ/GAS,#/#		2.0		*****	
HUMIDITY,#/# - CALC.		PRES.DROP,IN.WG		6.1		*****	

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 72.0

SULFITE/SO2-MOL/MOL = 3.82

SUMP RESID.TIME,MIN = 2.8

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0617

MOL% TOTAL SULF= 8.07

O2 AT FURN.EX.= 2.60

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

DATE 2-6-70

TIME OF DAY 1100

INPUT FOR EQ. - KIN. PROG.

MATERIAL BALANCES

SULFUR **MAGNESIUM** **FLYASH** **WATER** **DRY GAS**

FURNACE

INPUT, #/HR

OUTPUT, #/HR

PART. SCRUBBER

INPUT, #/HR

INPUT, #/HR

SO₂ ABSORBERS

INPUT, #/HR

OUTPUT, #/HR

* *S02 ABSORBERS-
PRODUCT COMP.

GM 502 /
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGD COMPOSITION

CLIPPY CONC. - GM MGD/100ML = 7.70

WCO PRECIPITATED. NO=0. YES=1

MGU PRESLAKED, NU-04, TEST 1
= SLAKED TO MG(OH)2, MEAS.

TOTAL.

**TOTAL,
COMBINED**

CODE

FREE
MONDAY TOTAL

MONO(TOTAL)
MONO(TOTAL)

MONDIDISOL

MONDSON

BISUM

MGO

SULFATE

MAGNESI

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150

	CARBON	HYDROGEN
0.6125	0.0485	

HYDROGEN 0-0463
OXYGEN 0-0817

UXY+NI 0-0011
EIII EII 0-0370

SULFUR	0.0370
ACU	0.0740

ASH 0.0740

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-055	CARD NUMBER	2	CARD NUMBER	3
DATE	2-6-70	WINDBOX ST, H2O	0.1030E 02	N.G. FLOW, %SCALE	0.9600E 02
TIME	1300	BURNER DP, H2O	0.5400E 01	N.G. STATIC, R.O.	0.8300E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5000E 01	SCREW SPEED, RPM	0.3500E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.5100E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2939E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4200E 02	TEMP. FURN. RECORDER, F	0.1000E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.6050E 03
ABS NOZ., PSIG	0.1000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1600E 03
ABS LOAD, PSIG	0.1000E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.1900E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1035E 04	AIR HEATER #2	0.7050E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8800E 03	PRI. AIR FAN IN.	0.8700E 02
CARD NUMBER	7	NO.2 BANK OUT	0.6750E 03	PRI. AIR WGT BULB	0.6050E 02
MODE OF OPER.	2	FURN. EXIT	0.1300E 03	SEC. AIR FAN IN.	0.3600E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR		SEC. AIR WGT BULB	0.3300E 02
PART. SCR. DP, H2O	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5700E 01	VENT. ABS. DP, H2O	0.1500E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.6500E 00	ABS CYC. DP, H2O	0.4800E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4600E 01	CARD NUMBER	11	FBA DP, H2O	0.0
CARD NUMBER	10	TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.0
TEMP. PILOT RECORDER, F	0.1420E 03	PART. CYC. EXIT	0.1460E 03	CARD NUMBER	12
#1 ORIFICE	0.0	ABS CYC. EXIT	0.1440E 03	MAKEUP FLOWS	
FBA INLET	0.0	PART. CYC. SUMP	0.1440E 03	PART. INIT. GAL	0.5560E 05
FBA EXIT	0.1360E 03	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.5576E 05
P.P. EXIT	0.1370E 03	FBA SUMP	0.0	PART. TIME, MIN	0.3550E 02
PART. CYC. SUMP	0.1360E 03	MGO SLAK TANK	0.7400E 02	ABS H2O IN. GAL	0.1231E 05
ABS CYC. SUMP	0.0	MGOH2 TANK		ABS H2O FI. GAL	0.1234E 05
FBA SUMP	0.0			ABS H2O TIME, MIN	0.3550E 02
MGO SLAK TANK	0.7400E 02			MGO ROTO. SCALE, %	0.8000E 01
MGOH2 TANK	0.5200E 02			MAKEUP SETTING	0.8000E 01

RUN NUMBER E-055

DATE 2-6-70

TIME OF DAY 1300

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/%	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	499.	130.0	---	---	---	---	0.006	48.2	496.	21.7
SECONDARY AIR	4957.	642.5	---	---	---	---	0.004	36.0	4938.	10.3
FURNACE EXIT	5907.	675.0	4034.7	---	772.	---	0.048	111.0	5638.	5.1
PART. SCRB. INLET	5907.	605.0	---	---	---	---	0.048	111.0	---	2.7
PART. CYC. EXIT	5837.	146.0	3743.5	---	---	---	0.117	138.7	5226.	-8.8
VENT ABS. INLET	5837.	146.0	---	---	---	---	0.117	138.7	---	-13.4
ABS CYC. EXIT	6195.	144.0	---	---	---	---	0.107	134.1	---	-25.7
FLOATING BED IN	---	---	---	---	---	---	---	---	---	---
FLOATING BED EX	---	---	---	---	---	---	---	---	---	---
P. EXIT ORIF.	6195.	136.0	1342.5	---	---	---	0.107	134.1	5598.	-25.7

SCRUBBER STREAM DATA

RUBBER STREAM DATA			VENTURI ABSORBER			FBA		
	TEMP, F	FLOW, GPM		TEMP, F	FLOW, #/M		TEMP, F	FLOW, #/M
PARTICULATE	52.0	4.65	GAS ABSORBER	52.0	7.0		***	***
MAKEUP WATER	144.0	5.03	MAKEUP WATER	74.0	2.4		***	***
PRODUCT LIQ.	144.0	23.76	MAKEUP MGO SL.	140.0	12.0		***	***
RECIRCULATED LIQ.			PRODUCT LIQ.	140.0	308.6		***	***
			REC. (SPRAY NDZ)		286.7		***	***
			REC. (FLOW NDZ.)				***	***

FURNACE PERFORMANCE

	FURNACE PERFORMANCE	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
	HEAT RELEASE,BTU/HR	S02 ABSORB.EFF	7.22	64.14	*****
%	FUEL AS COAL	FLYASH COL.EFF	*****	*****	*****
	COAL FLOW RATE,#/HR	S03 ABSORB.EFF	*****	*****	*****
NAT.GAS	FLOW,#/HR	NOX ABSORB.EFF	*****	*****	*****
%	EXCESS AIR	GAS VELOCITY,FPS	157.9	82.0	/*****
OXYGEN,	%DRY,MEAS.	LIQ/GAS,GAL/MCF	15.2	20.0	*****
CO2,%	DRY-CALC.	LIQ/GAS,#/#	2.0	2.8	*****
HUMIDITY,#/#	- CALC.	PRES.DROP,IN.WG	6.4	1.5	*****
					*

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER		FLOATING BED ABSORBER
KGA, #MOLE/HR-FT ² ,	=	68.9
SULFITE/SO ₂ -MOL/MOL	=	2.84
SUMP RESID.TIME, MIN	=	2.8

SULFATE FORMATION PARAMETERS

```
CONC.,GM-MOLE/L= 0.0628
MOL% TOTAL SULF= 9.47
O2 AT FURN. EX.= 2.70
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****
```

*** MEANS ITEM NOT MEASURED
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
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MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	E-055	DATE	2-6-70	TIME OF DAY	1300
MATERIAL BALANCES					
FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	17.57	-----	35.15	250.0	5628.
OUTPUT, #/HR	23.68	-----	*****	268.9	5638.
PART. SCRUBBER					
INPUT, #/HR	23.68	-----	*****	2595.	5638.
OUTPUT, #/HR	20.37	-----	*****	3126.	5226.
SO2 ABSORBERS					
INPUT, #/HR	20.37	6.71	*****	1168.	5226.
OUTPUT, #/HR	23.06	7.67	*****	1269.	5598.

INPUT FOR EQ. - KIN. PROG.
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.487296
 HYDROGEN 0.525336
 OXYGEN 1.391977
 NITROGEN 5.037359
 SULFUR 0.009280
 FEED RATE, #/SEC = 1.64
 ENTHALPY, BTU/# = 290.

MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML = 7.70
 MGO PRESLAKED, NO=0, YES=1 0
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 5.40
 SP. GRAVITY, HYDROM. = 1.3070

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	E-056	CARD NUMBER	2	CARD NUMBER	3
DATE	2-6-70	WINDBOX ST,H2O	0.1130E 02	N.G. FLOW,%SCALE	0.9600E 02
TIME	1630	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.5800E 01	SCREW SPEED,RPM	0.3400E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX,%-BM	0.2200E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX,ST,H2O	0.4700E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2936E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4200E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4350E 02	SEC.AIR DRIF.	0.9500E 02	PART.SCRUB.IN	0.6100E 03
ABS NOZ.,PSIG	0.1000E 02	WINDBOX-TOP	0.6550E 03	#1 DRIFICE	0.1550E 03
ABS LOAD,PSIG	0.1350E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.1200E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	5	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1035E 04	PRI.AIR FAN IN.	0.9000E 02
		NO.2 BANK OUT	0.9050E 03	PRI.AIR WGT BULB	0.6250E 02
CARD NUMBER	7	FURN. EXIT	0.7000E 03	SEC.AIR FAN IN.	0.3700E 02
MODE OF OPER.	2	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.3300E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6000E 01				
PART.CYC.DP,H2O	0.5800E 01				
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4600E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1500E 00	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.4750E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1450E 03	PART.CYC.EXIT	0.1470E 03	PART.INIT.GAL	0.5651E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1460E 03	PART.FINAL,GAL	0.5668E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1450E 03	PART.TIME,MIN	0.3500E 02
P.P.EXIT	0.1410E 03	ABS CYC.SUMP	0.1410E 03	ABS H2O IN.GAL	0.1244E 05
PART.CYC.SUMP	0.1410E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1246E 05
ABS CYC.SUMP	0.1400E 03	MGO SLAK TANK	0.8000E 02	ABS H2O TIME,MIN	0.3500E 02
FBA SUMP	0.0	MGOH2 TANK	0.8200E 02	MGO ROTO.SCALE,%	0.3500E 02
MGO SLAK TANK	0.8100E 02			MAKEUP SETTING	0.3500E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.5550E 02				

RUN NUMBER E-056

DATE 2-6-70

TIME OF DAY 1630

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	501.	125.0	---	---	---	---	0.007	50.9	498.	21.7
SECONDARY AIR	4977.	640.0	---	---	---	---	0.004	34.6	4959.	11.3
FURNACE EXIT	5943.	700.0	4187.8	---	---	2.4120	0.049	111.6	5667.	4.7
PART. SCRUB. INLET	5943.	610.0	---	---	---	---	0.049	111.6	---	2.7
PART. CYC. EXIT	5824.	147.0	4098.6	---	---	---	0.120	139.4	5201.	-9.5
VENT ABS. INLET	5824.	147.0	---	---	---	---	0.120	139.4	---	-14.1
ABS CYC. EXIT	6167.	146.0	---	---	---	---	0.109	134.8	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6167.	141.0	1611.2	---	---	---	0.109	134.8	5560.	-25.7

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP, F	VENTURI FLOW, #/M	FBA TEMP, F	FLOW, #/M
PARTICULATE	55.0	4.80	---	55.0	3.3	---	---
MAKEUP WATER	145.0	5.09	MAKEUP MGD SL.	80.0	4.4	---	---
PRODUCT LIQ.	145.0	23.76	PRODUCT LIQ.	141.0	12.0	---	---
RECIRCULATED LIQ.	---	---	REC. (SPRAY NOZ)	141.0	77.2	---	---
---	---	---	REC. (FLOW NOZ.)	---	227.9	---	---

FURNACE PERFORMANCE
HEAT RELEASE, BTU/HR
% FUEL AS COAL
COAL FLOW RATE, #/HR
NAT. GAS FLOW, #/HR
% EXCESS AIR
OXYGEN, % DRY-CALC.
CO2, % DRY-CALC.
HUMIDITY, #/# - CALC.

0.616E 07
96.9
490.1
8.7
10.5
2.20
16.18
0.049

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF
FLYASH COL. EFF
SO3 ABSORB. EFF
NOX ABSORB. EFF
GAS VELOCITY, FPS
LIQ/GAS, GAL/MCF
LIQ/GAS, #/#
PRES. DROP, IN. WG

PART.
2.13

158.2
15.1
2.0
6.0

VENT ABS.
60.69

82.0
15.9
2.2
0.1

FLOAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 62.2
SULFITE/SO2-MOL/MOL = 3.90
SUMP RESID. TIME, MIN = 2.8

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID. TIME, MIN

=
=
=

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L = 0.0409
MOL% TOTAL SULF = 4.51
O2 AT FURN. EX. = 2.20
O2 AT ABSORB. IN. = *****
O2 AT ABSORB. EX. = *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER E-056	DATE 2-6-70	TIME OF DAY 1630
MATERIAL BALANCES		
FURNACE	SULFUR	MAGNESIUM
INPUT, #/HR	18.13	---
OUTPUT, #/HR	24.67	---
PART. SCRUBBER		
INPUT, #/HR	24.67	---
OUTPUT, #/HR	22.16	---
S02 ABSORBERS		
INPUT, #/HR	22.16	12.25
OUTPUT, #/HR	31.41	17.80

*S02 ABSORBERS- PRODUCT COMP.	GM S02/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	5.89	0.9208	---	SLURRY CONC.- GM MGO/100ML = 7.70
COMBINED	5.89	0.9208	---	MGO PRESLAKED, NO=0, YES=1 0
FREE	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	5.89	0.9208	---	PRODUCT MG BASE PHYSICAL PROPERTIES
MONO(DISSOLVED)	1.35	0.2109	2.194	ACID STRENGTH, PH = 7.00
MONO(SOLID)	4.54	0.7099	15.050	SP.GRAVITY, HYDROM. = 1.0350
BISULFITE	0.05	0.0039	0.073	
MGO	0.45	0.0696	0.278	
SULFATE	0.26	0.0409	0.491	
MAGNESIUM	6.60	1.0313	---	PARTICULATE SCRUBBER PRODUCT
FLYASH	---	---	*****	ACID STRENGTH, PH = 2.00
SOLIDS, MG	---	---	10.643	FLYASH CONC. GM/100ML = 0.64

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0436

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.499373
 HYDROGEN 0.542241
 OXYGEN 1.390574
 NITROGEN 5.026237
 SULFUR 0.009516

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = -11.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-058	CARD NUMBER	2	CARD NUMBER	3
DATE	3-9-70	WINDBOX ST, H2O	0.1000E 02	N.G. FLOW, %SCALE	0.9800E 02
TIME	1300	BURNER DP, H2O	0.5500E 01	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1500E 01	FURN. ST, H2O	0.4800E 01	SCREW SPEED, RPM	0.4120E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.2000E 01	02 FURN. EX. % - 8M	0.1000E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.4000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2881E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4100E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4350E 02	SEC. AIR ORIF.	0.1000E 03	PART. SCRUB. IN	0.1300E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1550E 03
ABS LOAD, PSIG	0.3000E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.0	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7050E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9400E 03	PRI. AIR FAN IN.	0.8300E 02
		NO.2 BANK OUT	0.8400E 03	PRI. AIR WGT BULB	0.6600E 02
CARD NUMBER	7	FURN. EXIT	0.6950E 03	SEC. AIR FAN IN.	0.4500E 02
MODE OF OPER.	2	COAL-AIR	0.1300E 03	SEC. AIR WGT BULB	0.4100E 02

CARD NUMBER	8	CARD NUMBER	9
PART. SCR. ST, HG	0.2000E 00	FBA INLET ST, HG	0.0
PART. SCR. DP, H2O	0.0400E 01	FBA SUMP DP, H2O	0.0
PART. CYC. DP, H2O	0.6000E 01	FBA DP, H2O	0.0
#1 ORIF. ST, HG	-0.8000E 00	FBA DEMIST. DP, H2O	0.0
#1 ORIF. DP, H2O	0.4600E 01		

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.7900E 02	PART. CYC. EXIT	0.1420E 03	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. EXIT	0.1400E 03	PART. FINAL, GAL	0.0
FBA EXIT	0.0	PART. CYC. SUMP	0.1400E 03	PART. TIME, MIN	0.0
P.P. EXIT	0.1350E 03	ABS CYC. SUMP	0.1400E 03	ABS H2O IN. GAL	0.0
PART. CYC. SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.0
ABS CYC. SUMP	0.1400E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.0
FBA SUMP	0.0	MGOH2 TANK	0.0	MGO ROTO. SCALE, %	0.5600E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5600E 02
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.6000E 02				

TIME OF DAY 1300

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED	
CARBON	0.527751
HYDROGEN	0.609263
OXYGEN	1.387212
NITROGEN	5.000123
SULFUR	0.010059

FEED RATE, #/SEC= 1.60

ENTHALPY, BTU/# = -1631.

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***SO2 ABSORBERS-
PRODUCT COMP.**

TOTAL,

COMBINED

FREE

MONO (TOTAL)

MONO(DISSOLVED)

MONO(SOLID)

BI SULFITE

MGO

SULFATE

MAGNESIUM

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-059	CARD NUMBER	2	CARD NUMBER	3
DATE	3-9-70	WINDBOX ST,H2O	0.1010E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	1800	BURNER DP,H2O	0.5900E 01	N.G. STATIC,R.O.	0.8900E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.4200E 01	SCREW SPEED,RPM	0.4200E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.9000E 00
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.4100E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2800E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4150E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.6150E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.3050E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	0	WINDBOX-EAST	0.9850E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE		NO.1 BANK OUT	0.8750E 03	PRI.AIR FAN IN.	0.6350E 02
		NO.2 BANK OUT	0.7300E 03	PRI.AIR WGT BULB	0.4800E 02
CARD NUMBER	7	FURN. EXIT	0.1200E 03	SEC.AIR FAN IN.	0.3000E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	0.2600E 02
PART.SCR.ST,HG	0.1500E 00				
PART.SCR.DP,H2O	0.6100E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.6000E 01	VENT.ABS.DP,H2O	0.1600E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7500E 00	ABS CYC.DP,H2O	0.5150E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4800E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1410E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.6453E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1410E 03	PART.FINAL,GAL	0.6464E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1410E 03	PART.TIME,MIN	0.1950E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.1420E 03	ABS H2O IN.GAL	0.1371E 05
PART.CYC.SUMP	0.1370E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1373E 05
ABS CYC.SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.1950E 02
FBA SUMP	0.0	MGOH2 TANK	0.7800E 02	MGO ROTO.SCALE,%	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.5900E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER F-059

DATE 3-9-70

TIME OF DAY 1800

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	492.	120.0	-----	-----	-----	-----	0.005	39.3	490.	21.7
SECONDARY AIR	4868.	638.8	-----	-----	-----	-----	0.003	26.2	4854.	10.1
FURNACE EXIT	5846.	730.0	*****	*****	*****	*****	0.050	111.2	5566.	4.1
PART.SCRB.INLET	5846.	615.0	*****	*****	*****	*****	0.050	111.2	-----	2.0
PART.CYC.EXIT	5820.	142.0	*****	*****	*****	*****	0.130	140.3	5149.	-10.2
VENT ABS.INLET	5820.	142.0	*****	*****	*****	*****	0.130	140.3	-----	-15.0
ABS CYC.EXIT	6030.	141.0	*****	*****	*****	*****	0.120	136.2	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	6030.	136.0	*****	*****	*****	*****	0.120	136.2	5382.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M
PARTICULATE	59.0	5.56	MAKEUP WATER	TEMP,F	4.8	*****
MAKEUP WATER	141.0	5.09	MAKEUP MGO SL.	TEMP,F	9.2	*****
PRODUCT LIQ.	141.0	23.15	PRODUCT LIQ.	TEMP,F	14.3	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	TEMP,F	504.0	*****
			REC.(FLOW NOZ.)	TEMP,F	504.0	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.644E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	513.0
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	4.3
O ₂ GEN,% DRY, MEAS.	0.90
CO ₂ ,% DRY-CALC.	17.32
HUMIDITY,#/# - CALC.	0.050

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	165.2
LIQ/GAS,GAL/MCF	14.1
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.1

VENT ABS.

83.9
34.3
5.0
1.6

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	9.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=
SULFITE/SO2-MOL/MOL	=
SUMP RESID.TIME,MIN	=

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0288
MOL% TOTAL SULF=	2.80
O2 AT FURN.EX.=	0.90
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-059

DATE 3-9-70

TIME OF DAY 1800

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	18.98	-----	-----	37.96	261.9	5554.	
OUTPUT, #/HR	*****	-----	-----	*****	280.7	5566.	
PART. SCRUBBER							
INPUT, #/HR	*****	-----	-----	*****	3063.	5566.	
OUTPUT, #/HR	*****	-----	-----	*****	3219.	5149.	

SO2 ABSORBERS

INPUT, #/HR	*****	23.59	*****	1475.	5149.
OUTPUT, #/HR	*****	19.97	*****	1504.	5382.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	6.40	GM SO2/ 100ML	GRAM/ 100ML	MAKEUP MGO COMPOSITION
COMBINED	6.01			SLURRY CONC.- GM MGO/100ML = 7.10
FREE	0.39			MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	5.62			% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	*****			
MONO(SOLID)	*****			PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	*****			ACID STRENGTH, PH = 8.90
MGO	0.0			SP.GRAVITY, HYDROM. = 1.0870
SULFATE	0.18			
MAGNESIUM	6.19			PARTICULATE SCRUBBER PRODUCT
FLYASH	-----			ACID STRENGTH, PH = 2.30
SOLIDS, MG	-----			FLYASH CONC. GM/100ML = 1.03

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.530262
 HYDROGEN 0.548321
 OXYGEN 1.386949
 NITROGEN 4.997803
 SULFUR 0.010112

FEED RATE, #/SEC= 1.63

ENTHALPY, BTU/# = -316.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-060	CARD NUMBER	2	CARD NUMBER	3
DATE	3-9-70	WINDBOX ST,H2O	0.1040E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	1920	BURNER DP,H2O	0.5900E 01	N.G. STATIC,R.O.	0.9200E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.4400E 01	SCREW SPEED,RPM	0.4200E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	D2 FURN.EX.%-BM	0.1000E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.4200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2881E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4150E 02	SEC.AIR DRIF.	0.6600E 03	PART.SCRUB.IN	0.6300E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.3100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9950E 03	PRI.AIR FAN IN.	0.7200E 02
		NO.2 BANK OUT	0.8850E 03	PRI.AIR WGT BULB	0.6100E 02
CARD NUMBER	7	FURN. EXIT	0.7350E 03	SEC.AIR FAN IN.	0.2700E 02
MODE OF OPER.	2	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.2700E 02
PART.SCR.ST,HG	0.1500E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.6400E 01	VENT.ABS.DP,H2O	0.1500E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.6000E 01	ABS CYC.DP,H2O	0.5300E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.7500E 00			FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4900E 01			FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1430E 03	PART.INIT.GAL	0.6464E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1420E 03	PART.FINAL,GAL	0.6498E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1420E 03	PART.TIME,MIN	0.5775E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.1420E 03	ABS H2O IN.GAL	0.1373E 05
PART.CYC.SUMP	0.1370E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1373E 05
ABS CYC.SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.5775E 02
FBA SUMP	0.0	MGOH2 TANK	0.8100E 02	MGO ROTO.SCALE,%	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7950E 02				
MAKEUP WATER	0.5900E 02				

RUN NUMBER F-060

DATE 3-9-70

TIME OF DAY 1920

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	498.	120.0	-----	-----	-----	-----	0.010	60.8	494.	21.7
SECONDARY AIR	4932.	641.3	-----	-----	-----	-----	0.004	33.9	4915.	10.4
FURNACE EXIT	5921.	735.0	5564.7	-----	-----	-----	0.051	112.8	5631.	4.2
PART-SCRB-INLET	5921.	630.0	-----	-----	-----	-----	0.051	112.8	-----	2.0
PART-CYC-EXIT	5952.	143.0	5707.7	-----	-----	-----	0.136	142.8	5239.	-10.2
VENT ABS-INLET	5952.	143.0	-----	-----	-----	-----	0.136	142.8	-----	-15.1
ABS CYC-EXIT	6117.	142.0	-----	-----	-----	-----	0.124	138.2	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	6117.	136.0	914.6	-----	-----	-----	0.124	138.2	5443.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M	FBA
PARTICULATE	59.0	5.89	MAKEUP WATER	TEMP,F FLOW,#/M	59.0	0.3	-----
MAKEUP WATER	142.0	5.09	MAKEUP MGO SL.	79.5	79.5	9.2	-----
PRODUCT LIQ.	142.0	23.15	PRODUCT LIQ.	142.0	142.0	14.3	-----
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ)	142.0	504.0	-----	-----
-----	-----	-----	REC.(FLOW NOZ.)	436.3	-----	-----	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.648E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	516.5
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	4.8
OXYGEN,%DRY,MEAS.	1.00
CO2,%DRY-CALC.	17.23
HUMIDITY,#/# - CALC.	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-2.57
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	164.9
LIQ/GAS,GAL/MCF	14.1
LIQ/GAS,#/#	1.9
PRES.DROP,IN.WG	6.4

VENT ABS.

83.98

82.8
30.1
4.3
1.5

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	119.0
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	9.2

**** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	-----
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	-----

CONC.,GM-MOLE/L=	-----
MOL% TOTAL SULF=	2.80
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	1.20
O2 AT ABSORB.EX=	1.10

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	F-060	DATE 3-9-70	TIME OF DAY 1920	INPUT FOR EQ. - KIN.PROG.				
MATERIAL BALANCES				SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE				19.11	---	38.22	270.5	5620.
INPUT, #/HR				32.43	---	*****	289.6	5631.
OUTPUT, #/HR								
PART. SCRUBBER				32.43	---	*****	3238.	5631.
INPUT, #/HR				30.95	---	*****	3262.	5239.
OUTPUT, #/HR								
SO2 ABSORBERS				30.95	*****	*****	1284.	5239.
INPUT, #/HR				*****	0.0	*****	1532.	5443.
OUTPUT, #/HR								
*SO2 ABSORBERS-PRODUCT COMP.				GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION	
TOTAL,				*****	*****	---	SLURRY CONC.- GM MGO/100ML = *****	
COMBINED				*****	*****	---	MGO PRESLAKED, ND=0, YES=1 0	
FREE				*****	*****	---	% SLAKED TO MG(OH)2, MEAS. = *****	
MONO(TOTAL)				*****	*****	---	PRODUCT MG BASE PHYSICAL PROPERTIES	
MONO(DISSOLVED)				*****	*****	---	ACID STRENGTH, PH = 8.60	
MONO(SOLID)				*****	*****	---	SP.GRAVITY, HYDROM. = 1.0730	
BISULFITE				*****	*****	*****		
MGO				*****	*****	*****		
SULFATE				*****	*****	*****		
MAGNESIUM				*****	*****	---	PARTICULATE SCRUBBER PRODUCT	
FLYASH				*****	*****	*****	ACID STRENGTH, PH = *****	
SOLIDS, MG				---	---	*****	FLYASH CONC. GM/100ML = *****	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-061	CARD NUMBER	2	CARD NUMBER	3
DATE	3-9-70	WINDBOX ST,H2O	0.1060E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	2030	BURNER DP,H2O	0.5800E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.4900E 01	SCREW SPEED,RPM	0.4200E 02
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.1000E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2250E 01	FURN.EX.ST,H2O	0.4800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2882E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4150E 02	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.6400E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.3100E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4700E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.9950E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8900E 03	PRI.AIR FAN IN.	0.7000E 02
		NO.2 BANK OUT	0.7450E 03	PRI.AIR WGT BULB	0.5200E 02
CARD NUMBER	7	FURN. EXIT	0.1200E 03	SEC.AIR FAN IN.	0.2600E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	0.2600E 02
PART.SCR.ST,HG	0.1500E 00				
PART.SCR.DP,H2O	0.6400E 01				
PART.CYC.DP,H2O	0.6000E 01				
#1 ORIF.ST,HG	-0.7500E 00				
#1 ORIF.DP,H2O	0.4850E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1600E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.5200E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1430E 03	PART.INIT.GAL	0.6499E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1420E 03	PART.FINAL,GAL	0.6532E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1420E 03	PART.TIME,MIN	0.5730E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1375E 05
PART.CYC.SUMP	0.1370E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1378E 05
ABS CYC.SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.5730E 02
FBA SUMP	0.0	MGOH2 TANK	0.7100E 02	MGO ROTO.SCALE,%	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.5900E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER F-061

DATE 3-9-70

TIME OF DAY 2030

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	499.	120.0	---	---	---	---	0.005	42.5	497.	21.7
SECONDARY AIR	4902.	643.8	---	---	---	---	0.003	32.8	4885.	10.6
FURNACE EXIT	5888.	745.0	5829.3	---	---	---	0.051	112.6	5603.	4.8
PART.SCRB.INLET	5888.	640.0	---	---	---	---	0.051	112.6	---	2.0
PART.CYC.EXIT	5921.	143.0	5715.3	---	---	---	0.137	143.1	5205.	-10.2
VENT ABS.INLET	5921.	143.0	---	---	---	---	0.137	143.1	---	-15.0
ABS CYC.EXIT	6113.	142.0	---	---	---	---	0.127	139.0	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6113.	136.0	1242.2	*****	*****	*****	0.127	139.0	5423.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	59.0	5.85	59.0 3.6	*****
MAKEUP WATER	142.0	5.09	80.0 9.2	*****
PRODUCT LIQ.	142.0	23.15	142.0 14.3	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ) 142.0 504.0	*****
			REC.(FLOW NOZ.) 450.9	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.645E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	513.9
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	4.8
OXYGEN,% DRY, MEAS.	1.00
CO2,% DRY-CALC.	17.23
HUMIDITY,#/# - CALC.	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.96
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	164.1
LIQ/GAS,GAL/MCF	14.2
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.4

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	98.8
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	9.2

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0558
MOL% TOTAL SULF=	5.18
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

FLOAT.BED

VENT ABS.	78.27
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

RUN NUMBER F-061

DATE 3-9-70

TIME OF DAY 2030

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.527847
HYDROGEN 0.550874
OXYGEN 1.387220
NITROGEN 5.000031
SULFUR 0.010064

FEED RATE, #/SEC = 1.64

ENTHALPY, BTU/# = -499.

DRY GAS

5591.
5603.

MAGNESIUM FLYASH

38.03

WATER

266.1
285.3

SULFUR

19.01
33.81

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

33.81
30.80

5603.
5205.

3211.
3264.

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

30.80
40.39

5205.
5423.

1447.
1541.

*
*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 6.80
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,

COMBINED

FREE

MONO(TOTAL)

MONO(DISSOLVED)

MONO(SOLID)

BISULFITE

MGO

SULFATE

MAGNESIUM

FLYASH

SOLIDS, MG

1.1610

1.1610

0.0

1.1610

0.0212

0.0558

1.2381

0.085

0.670

22.396

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = *****

SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-062	CARD NUMBER	2	CARD NUMBER	3
DATE	3-9-70	WINDBOX ST, H2O	0.1060E 02	N.G. FLOW, %SCALE	0.9800E 02
TIME	2125	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.9300E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.4800E 01	SCREW SPEED, RPM	0.4200E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. % - BM	0.8000E 00
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2250E 01	FURN. EX. ST, H2O	0.4400E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2882E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.8500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4150E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.6450E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1550E 03
ABS LOAD, PSIG	0.3100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1000E 04	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8950E 03	PRI. AIR FAN IN.	0.6900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7550E 03	PRI. AIR WGT BULB	0.4750E 02
MODE OF OPER.	2	FURN. EXIT	0.1200E 03	SEC. AIR FAN IN.	0.0
PART. SCR. ST, HG	0.1500E 00	COAL-AIR		SEC. AIR WGT BULB	0.0
PART. SCR. DP, H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.7500E 00	ABS CYC. DP, H2O	0.5300E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4900E 01	CARD NUMBER	11	FBA DP, H2O	0.0
CARD NUMBER	10	TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.0
TEMP. PILOT RECORDER, F	0.1410E 03	PART. CYC. EXIT	0.1440E 03	CARD NUMBER	12
#1 ORIFICE	0.0	ABS CYC. EXIT	0.1420E 03	MAKEUP FLOWS	
FBA INLET	0.0	PART. CYC. SUMP	0.1430E 03	PART. INIT. GAL	0.6533E 05
FBA EXIT	0.1370E 03	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.6561E 05
P.P. EXIT	0.1370E 03	FBA SUMP	0.0	PART. TIME, MIN	0.4700E 02
PART. CYC. SUMP	0.1370E 03	MGO SLAK TANK	0.7100E 02	ABS H2O IN. GAL	0.1379E 05
ABS CYC. SUMP	0.1380E 03	MGOH2 TANK		ABS H2O FI. GAL	0.1380E 05
FBA SUMP	0.0			ABS H2O TIME, MIN	0.4700E 02
MGO SLAK TANK	0.0			MGO ROTO. SCALE, %	0.9800E 02
MGOH2 TANK	0.6100E 02			MAKEUP SETTING	0.9800E 02
MAKEUP WATER	0.5900E 02				

RUN NUMBER F-062

DATE 3-9-70

TIME OF DAY 2125

FLUE GAS DATA

	FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	499.	120.0	-----	-----	-----	-----	0.003	28.9	498.	21.7
SECONDARY AIR	4927.	642.5	-----	-----	-----	-----	0.001	6.4	4922.	10.6
FURNACE EXIT	5922.	755.0	5278.8	-----	-----	-----	0.049	111.4	5645.	4.4
PART.SCRB.INLET	5922.	645.0	-----	-----	-----	-----	0.049	111.4	-----	2.0
PART.CYC.EXIT	5949.	144.0	4705.0	-----	-----	0.0247	0.136	142.8	5236.	-10.2
VENT ABS.INLET	5949.	144.0	-----	-----	-----	-----	0.136	142.8	-----	-15.1
ABS CYC.EXIT	6172.	142.0	-----	-----	-----	-----	0.124	138.2	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	6172.	137.0	934.1	*****	*****	0.0286	0.124	138.2	5492.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	59.0	5.88	-----	59.0	-----
MAKEUP WATER	143.0	5.09	MAKEUP MGO SL.	61.0	-----
PRODUCT LIQ.	143.0	23.15	PRODUCT LIQ.	142.0	-----
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	142.0	-----
			REC.(FLOW NOZ.)	455.7	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.656E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	522.8
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	3.8
OXYGEN,% DRY, MEAS.	0.80
CO2,% DRY-CALC.	17.40
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

S02 ABSORB.EFF	10.87
FLYASH COL.EFF	-----
S03 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	165.0
LIQ/GAS,GAL/MCF	14.1
LIQ/GAS,#/#	1.9
PRES.DROP,IN.WG	6.2

VENT ABS.

80.15
-15.71

83.5
31.2
4.4
1.6

FLOAT.BED

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	105.9
SULFITE/S02-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	9.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/S02-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	5.18
O2 AT FURN.EX.=	0.80
O2 AT ABSORB.IN=	0.80
O2 AT ABSORB.EX=	0.80

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-062

DATE 3-9-70

TIME OF DAY 2125

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE

INPUT, #/HR 19.34

OUTPUT, #/HR 30.82

PART. SCRUBBER

INPUT, #/HR 30.82

OUTPUT, #/HR 25.48

SO2 ABSORBERS

INPUT, #/HR 25.48

OUTPUT, #/HR *****

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL, *****

COMBINED *****

FREE *****

MONO(TOTAL) *****

MONO(DISSOLVED) *****

MONO(SOLID) *****

BISULFITE *****

MGO *****

SULFATE *****

MAGNESIUM *****

FLYASH *****

SOLIDS, MG *****

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

OXY+NIT 0.0817

SULFUR 0.0370

ASH 0.0740

WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS

----- 38.69 258.4 5633.

----- ***** 277.5 5645.

----- ***** 3222. 5645.

----- ***** 3262. 5236.

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 489.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****

MGO PRESLAKED, NO=0, YES=1 0 *****

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = *****

SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.532623

HYDROGEN 0.534495

OXYGEN 1.386672

NITROGEN 4.995630

SULFUR 0.010158

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-063	CARD NUMBER	2	CARD NUMBER	3
DATE	3-9-70	WINDBOX ST, H2O	0.1080E 02	N.G. FLOW, %SCALE	0.9800E 02
TIME	2210	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.9300E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5100E 01	SCREW SPEED, RPM	0.4200E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. %BM	0.1100E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2250E 01	FURN. EX. ST, H2O	0.4400E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2882E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.8500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4150E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.6450E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.3150E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.9950E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9050E 03	PRI. AIR FAN IN.	0.7500E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7600E 03	PRI. AIR WGT BULB	0.5500E 02
MODE OF OPER.	2	FURN. EXIT	0.1150E 03	SEC. AIR FAN IN.	0.0
PART. SCR. ST, HG	0.1500E 00	COAL-AIR		SEC. AIR WET BULB	0.0
PART. SCR. DP, H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.1550E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.7500E 00	ABS CYC. DP, H2O	0.5300E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4850E 01			FBA DP, H2O	0.0
				FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1400E 03	TEMP. THERMOMETERS, F	0.1440E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1420E 03	PART. INIT. GAL	0.6561E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1420E 03	PART. FINAL, GAL	0.6593E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1420E 03	PART. TIME, MIN	0.5385E 02
P.P. EXIT	0.1370E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1380E 05
PART. CYC. SUMP	0.1370E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1382E 05
ABS CYC. SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.5385E 02
FBA SUMP	0.0	MGOH2 TANK	0.7200E 02	MGO ROTO. SCALE, %	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7100E 02				
MAKEUP WATER	0.5900E 02				

RUN NUMBER F-063

DATE 3-9-70

TIME OF DAY 2210

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	501.	115.0	-----	-----	-----	-----	0.006	45.4	498.	21.7
SECONDARY AIR	4927.	643.8	-----	-----	-----	-----	0.001	6.4	4922.	10.8
FURNACE EXIT	5917.	760.0	5009.4	-----	-----	4.2127	0.049	111.1	5642.	4.4
PART.SCRB.INLET	5917.	645.0	-----	-----	-----	-----	0.049	111.1	-----	2.0
PART.CYC.EXIT	5917.	144.0	4794.9	-----	-----	-----	0.136	142.8	5207.	-10.2
VENT ABS.INLET	5917.	144.0	-----	-----	-----	-----	0.136	142.8	-----	-15.0
ABS CYC.EXIT	6110.	142.0	-----	-----	-----	-----	0.125	138.5	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT DRIF.	6110.	137.0	1034.0	*****	*****	*****	0.125	138.5	5431.	-25.7

SCRUBBER STREAM DATA

	TEMP.,F	FLOW,GPM	GAS ABSORBER	VENT ABS.	FLOAT.BED
PARTICULATE	59.0	5.90	MAKEUP WATER	78.44	*****
MAKEUP WATER	142.0	5.09	MAKEUP MGD SL.	*****	*****
PRODUCT LIQ.	142.0	23.15	PRODUCT LIQ.	*****	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	504.0	*****
			REC.(FLOW NOZ.)	455.7	*****

FURNACE PERFORMANCE

	TEMP.,F	FLOW,GPM	GAS ABSORBER	VENT ABS.	FLOAT.BED
HEAT RELEASE,BTU/HR	0.647E 07			78.44	*****
% FUEL AS COAL	97.0			*****	*****
COAL FLOW RATE,#/HR	515.1			*****	*****
NAT.GAS FLOW,#/HR	8.9			*****	*****
% EXCESS AIR	5.2			82.8	*****
OXYGEN,%DRY,MEAS.	1.10			31.4	*****
CO2,%DRY-CALC.	17.14			4.5	*****
HUMIDITY, #/# - CALC.	0.049			1.5	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	99.5	KGA, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****	SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	9.2	SUMP RESID.TIME,MIN	=	*****

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	5.18
O2 AT FURN.EX.=	1.10
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-063

DATE 3-9-70

TIME OF DAY 2210

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED	
CARBON	0.525517
HYDROGEN	0.554351
OXYGEN	1.387501
NITROGEN	5.002172
SULFUR	0.010020

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 558.

```
MAKEUP MGU COMPOSITION
SLURRY CONC.-- GM MGD/100ML      = *****
MGD PRESLAKED, NO=0, YES=1       U
% SLAKED TO MG(OH)2, MEAS.       *****
```

PRODUCT MG	BASE	PHYSICAL	PROPERTIES
ACID STRENGTH, PH	=	=	***
SP.GRAVITY, HYDROM.	=	=	*****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = ***
FLYASH CONC. GM/100ML = ***

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

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MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-064	CARD NUMBER	3
DATE	3-9-70	N.G. FLOW, \$SCALE	0.9800E 02
TIME	2315	N.G. STATIC, R.O.	0.9400E 01
PRI. AIR ST, HG	0.1600E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2400E 01	02 FURN. EX. \$-BM	0.1000E 01
SEC. AIR ST, HG	0.1600E 01	COMB. FURN. EX. \$	0.0
SEC. AIR DP, H2O	0.2250E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4150E 02	PART. SCRUB. IN	0.6450E 03
ABS NOZ., PSIG	0.2000E 02	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.3300E 02	FBA INLET	0.0
ABS ORIF. INCH	0.4600E 01	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	PRI. AIR FAN IN.	0.7500E 02
		PRI. AIR WGT BULB	0.5350E 02
		SEC. AIR FAN IN.	0.0
		SEC. AIR WET BULB	0.0

CARD NUMBER	7	CARD NUMBER	9
MODE OF OPER.	2	FBA INLET ST, HG	0.0
PART. SCR. ST, HG	0.2000E 00	FBA SUMP DP, H2O	0.0
PART. SCR. DP, H2O	0.6400E 01	FBA DP, H2O	0.0
PART. CYC. DP, H2O	0.6000E 01	FBA DEMIST. DP, H2O	0.0
#1 ORIF. ST, HG	-0.7500E 00		
#1 ORIF. DP, H2O	0.4900E 01		

CARD NUMBER	10	CARD NUMBER	12
TEMP. PILOT RECORDER, F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART. INIT. GAL	0.6594E 05
FBA INLET	0.0	PART. FINAL. GAL	0.6630E 05
FBA EXIT	0.0	PART. TIME, MIN	0.6217E 02
P.P. EXIT	0.1370E 03	ABS H2O IN. GAL	0.1382E 05
PART. CYC. SUMP	0.1370E 03	ABS H2O FI. GAL	0.1386E 05
ABS CYC. SUMP	0.1370E 03	ABS H2O TIME, MIN	0.6217E 02
FBA SUMP	0.0	MGO ROTO. SCALE, \$	0.1000E 03
MGO SLAK TANK	0.0	MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7300E 02		
MAKEUP WATER	0.5900E 02		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-064 DATE 3-9-70 TIME OF DAY 2315

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	19.23	-----	38.47	257.8	5654.
OUTPUT, #/HR	29.94	-----	*****	277.0	5666.
PART. SCRUBBER					
INPUT, #/HR	29.94	-----	*****	3219.	5666.
OUTPUT, #/HR	27.72	-----	*****	3261.	5237.
SO2 ABSORBERS					
INPUT, #/HR	27.72	*****	*****	1526.	5237.
OUTPUT, #/HR	*****	0.0	*****	1583.	5487.

* * * * *

*SO2 ABSORBERS-PRODUCT COMP.	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION
TOTAL,	*****	*****	-----	SLURRY CONC.- GM MGO/100ML = *****
COMBINED	*****	*****	-----	MGO PRESLAKED, NO=0, YES=1 0 *****
FREE	*****	*****	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	*****	*****	-----	
MONO(DISSOLVED)	*****	*****	-----	
MONO(SOLID)	*****	*****	*****	
BISULFITE	*****	*****	*****	
MGO	*****	*****	*****	
SULFATE	*****	*****	*****	
MAGNESIUM	*****	*****	*****	
FLYASH	-----	-----	-----	
SOLIDS, MG	-----	-----	*****	

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	=	*****
SP.GRAVITY, HYDROM.	=	*****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	=	*****
FLYASH CONC. GM/100ML	=	*****

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED	
CARBON	0.527907
HYDROGEN	0.548154
OXYGEN	1.387225
NITROGEN	4.999971
SULFUR	0.010067

FEED RATE, #/SEC= 1.66

ENTHALPY, BTU/# = 385.

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-065	CARD NUMBER	3
DATE	3-10-70	N.G. FLOW,%SCALE	0.9800E 02
TIME	0020	N.G. STATIC,R.O.	0.9200E 01
PRI.AIR ST, HG	0.1600E 01	SCREW SPEED,RPM	0.4250E 03
PRI.AIR DP,H2O	0.2300E 01	O2 FURN.EX.%-BM	0.1000E 01
SEC.AIR ST,HG	0.1600E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		CELL TEMP,F	0.0
		BARDMETRIC,HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.8000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4150E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.6500E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6200E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.3300E 02	WINDBOX-WEST	0.6200E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4600E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1000E 04	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9000E 03	PRI.AIR FAN IN.	0.7350E 02
		NO.2 BANK OUT	0.7450E 03	PRI.AIR WGT BULB	0.5300E 02
CARD NUMBER	7	FURN. EXIT	0.1000E 03	SEC.AIR FAN IN.	0.0
MODE OF OPER.	2	COAL-AIR	0.1000E 03	SEC.AIR WET BULB	0.0
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6400E 01				
PAPT.CYC.DP,H2O	0.6000E 01				
#1 ORIF.ST,HG	-0.7500E 00				
#1 ORIF.DP,H2O	0.4850E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1550E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.5300E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1390E 03	TEMP.THERMOMETERS,F	0.1440E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1430E 03	PART.INIT.GAL	0.6631E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1430E 03	PART.FINAL,GAL	0.6667E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1430E 03	PART.TIME,MIN	0.6175E 02
P.P.EXIT	0.1370E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1386E 05
PART.CYC.SUMP	0.1370E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1389E 05
ABS CYC.SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6175E 02
FBA SUMP	0.0	MGOH2 TANK	0.7500E 02	MGO ROTO.SCALE,%	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7400E 02				
MAKEUP WATER	0.5900E 02				

RUN NUMBER F-065

DATE 3-10-70

TIME OF DAY 0020

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SD3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	497.	100.0	-----	-----	-----	-----	0.005	41.4	495.	21.7
SECONDARY AIR	4896.	633.8	-----	-----	-----	-----	0.001	6.4	4890.	11.0
FURNACE EXIT	5881.	745.0	5258.1	-----	769.	-----	0.049	111.3	5606.	5.0
PART.SCRB.INLET	5881.	650.0	-----	-----	-----	-----	0.049	111.3	-----	2.7
PART.CYC.EXIT	5918.	144.0	5267.1	-----	113.	-----	0.137	142.9	5206.	-10.2
VENT ABS.INLET	5918.	144.0	-----	-----	-----	-----	0.137	142.9	-----	-15.0
ABS CYC.EXIT	6111.	143.0	-----	-----	-----	-----	0.126	138.7	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	6111.	137.0	1380.8	-----	760.	-----	0.126	138.7	5429.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	59.0	5.84	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	143.0	5.09	MAKEUP MGO SL.	59.0 5.0	-----
PRODUCT LIQ.	143.0	23.15	PRODUCT LIQ.	74.0 9.2	-----
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ)	143.0 15.0	-----
-----	-----	-----	REC.(FLOW NOZ.)	504.0 504.0	-----
-----	-----	-----	-----	446.1 446.1	-----

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,% DRY, MEAS.	CO2,% DRY-CALC.	HUMIDITY,#/# - CALC.	VENT ABS.	FLOAT.BED
HEAT RELEASE,BTU/HR	0.646E 07	97.0	514.2	8.9	4.8	1.00	17.23	0.049	73.78	-----
% FUEL AS COAL	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
COAL FLOW RATE,#/HR	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NAT.GAS FLOW,#/HR	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
% EXCESS AIR	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
OXYGEN,% DRY, MEAS.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
CO2,% DRY-CALC.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
HUMIDITY,#/# - CALC.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	86.8	KGA,#MOLE/HR-FT2	=	-----
SULFITE/SO2-MOL/MOL	=	-----	SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	8.8	SUMP RESID.TIME,MIN	=	-----

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0406
MOL% TOTAL SULF=	3.39
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	-----
O2 AT ABSORB.EX=	-----

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-065 DATE 3-10-70 TIME OF DAY 0020 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE INPUT, #/HR 19.03 OUTPUT, #/HR 30.51
 PART-SCRUBBER INPUT, #/HR 30.51 OUTPUT, #/HR 28.38
 Sulfur Input, #/HR 19.03 Output, #/HR 30.51
 Water Input, #/HR 255.1 Output, #/HR 274.2
 Dry Gas Input, #/HR 5595. Output, #/HR 5606.
 Input Flows, #atoms/100#feed
 Carbon 0.527853
 Hydrogen 0.548818
 Oxygen 1.387221
 Nitrogen 5.000024
 Sulfur 0.010064

FEED RATE, #/SEC= 1.64

ENTHALPY, BTU/# = 278.

* SO2 ABSORBERS- PRODUCT COMP.
 TOTAL, COMBINED FREE MONO(TOTAL) MONO(DISSOLVED) MONO(SOLID) BISULFITE MGO SULFATE MAGNESIUM FLYASH SOLIDS, MG
 SO2 ABSORBERS INPUT, #/HR 28.38 OUTPUT, #/HR 45.89
 MAKEUP MGJ COMPOSITION
 SLURRY CONC.- GM MGO/100ML = *****
 MGO PRESLAKED, NO=0, YES=1 *****
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 8.80
 SP.GRAVITY, HYDROM. = 1.0580

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-066	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST, H2O	0.1110E 02	N.G. FLOW, %SCALE	0.9850E 02
TIME	0125	BURNER DP, H2O	0.5900E 01	N.G. STATIC, R.O.	0.9400E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.5300E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. %BM	0.1100E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2250E 01	FURN. EX. ST, H2O	0.5000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2883E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4150E 02	SEC. AIR ORIF.	0.8000E 02	PART. SCRUB. IN	0.6500E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1450E 03
ABS LOAD, PSIG	0.3300E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4600E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1010E 04	PRI. AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.9100E 03	PRI. AIR WGT BULB	0.5300E 02
CARD NUMBER	7	FURN. EXIT	0.7500E 03	SEC. AIR FAN IN.	0.0
MODE OF OPER.	2	COAL-AIR	0.9500E 02	SEC. AIR WET BULB	0.0
PART. SCR. ST, HG	0.2000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.6500E 01	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.6000E 01	ABS CYC. DP, H2O	0.5300E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. ST, HG	-0.7500E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.4900E 01			FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART. CYC. EXIT	0.1440E 03	PART. INIT. GAL	0.6668E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1420E 03	PART. FINAL, GAL	0.6702E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1430E 03	PART. TIME, MIN	0.5875E 02
P.P. EXIT	0.1370E 03	ABS CYC. SUMP	0.1420E 03	ABS H2O IN. GAL	0.1389E 05
PART. CYC. SUMP	0.1380E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1393E 05
ABS CYC. SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.5875E 02
FBA SUMP	0.0	MGOH2 TANK	0.7600E 02	MGO ROTO. SCALE, %	0.9600E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9600E 02
MGOH2 TANK	0.7450E 02				
MAKEUP WATER	0.5800E 02				

RUN NUMBER F-066

DATE 3-10-70

TIME OF DAY 0125

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	510.	95.0	-----	-----	-----	-----	0.005	40.8	508.	21.7
SECONDARY AIR	4951.	635.0	-----	-----	-----	-----	0.001	6.4	4945.	11.1
FURNACE EXIT	5953.	750.0	5435.5	-----	-----	-----	0.049	111.1	5676.	5.0
PART.SCRB.INLET	5953.	650.0	-----	-----	-----	-----	0.049	111.1	-----	2.7
PART.CYC.EXIT	5948.	144.0	4929.4	-----	-----	-----	0.136	142.8	5235.	-10.2
VENT ABS.INLET	5948.	144.0	-----	-----	-----	-----	0.136	142.8	-----	-15.1
ABS CYC.EXIT	6111.	142.0	-----	-----	-----	-----	0.125	138.5	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	6111.	137.0	905.7	*****	*****	*****	0.125	138.5	5432.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE				TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	58.0	5.83	MAKEUP WATER	58.0 4.4	*****
PRODUCT LIQ.	143.0	5.09	MAKEUP MGO SL.	74.5 8.9	*****
RECIRCULATED LIQ.	143.0	23.15	PRODUCT LIQ.	142.0 15.0	*****
			REC.(SPRAY NOZ)	142.0 504.0	*****
			REC.(FLOW NOZ.)	446.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.651E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	518.2
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	5.2
OXYGEN,% DRY, MEAS.	1.10
CO2,% DRY-CALC.	17.14
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	9.31
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	165.0
LIQ/GAS,GAL/MCF	14.1
LIQ/GAS,#/#	1.9
PRES.DROP,IN.WG	6.5

FLOAT.BED

VENT ABS.	81.63
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2,	=	109.9
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	8.8

**** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0397
MOL% TOTAL SULF=	4.37
O2 AT FURN.EX.=	1.10
O2 AT ABSORB.IN=	0.90
O2 AT ABSORB.EX=	1.00

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-066

DATE 3-10-70

TIME OF DAY 0125

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	19.17	---	38.35	257.1	5665.
OUTPUT, #/HR	31.95	---	*****	276.3	5676.

PART. SCRUBBER

INPUT, #/HR	31.95	---	*****	3195.	5676.
OUTPUT, #/HR	26.72	---	*****	3262.	5235.

SO2 ABSORBERS

INPUT, #/HR	26.72	*****	*****	1514.	5235.
OUTPUT, #/HR	31.26	23.51	*****	1569.	5432.

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	5.56	0.8687	---	---	---
COMBINED	5.56	0.8687	---	---	---
FREE	0.0	0.0	---	---	---
MONO(TOTAL)	5.56	0.8687	---	---	---
MONO(DISSOLVED)	*****	*****	*****	*****	*****
MONO(SOLID)	*****	*****	*****	*****	*****
BISULFITE	*****	*****	*****	*****	*****
MGO	1.14	0.1781	0.712	0.712	0.712
SULFATE	0.25	0.0397	0.476	0.476	0.476
MAGNESIUM	6.95	1.0866	---	---	---
FLYASH	---	---	---	---	---
SOLIDS, MG	---	---	---	---	---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.525520
HYDROGEN	0.545535
OXYGEN	1.387501
NITROGEN	5.002171
SULFUR	0.010020

FEED RATE, #/SEC= 1.66

ENTHALPY, BTU/# = 341.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	*****
MGO PRESLAKED, NO=0, YES=1	0
% SLAKED TO MG(OH)2, MEAS. =	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	8.30
SP.GRAVITY, HYDROM. =	1.0620

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	*****
FLYASH CONC. GM/100ML =	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-067	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1120E 02	N.G. FLOW,%SCALE	0.9850E 02
TIME	0220	BURNER DP,H2O	0.5800E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.5500E 01	SCREW SPEED,RPM	0.4250E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.1000E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5400E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.5200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4150E 02	SEC.AIR ORIF.	0.8000E 02	PART.SCRUB.IN	0.6600E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.3700E 02	WINDBOX-WEST	0.6200E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4500E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1020E 04	PRI.AIR FAN IN.	0.7500E 02
		NO.2 BANK OUT	0.9150E 03	PRI.AIR WGT BULB	0.5350E 02
CARD NUMBER	7	FURN. EXIT	0.7700E 03	SEC.AIR FAN IN.	0.0
MODE OF OPER.	2	COAL-AIR	0.9500E 02	SEC.AIR WET BULB	0.0
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.6000E 01	VENT.ABS.DP,H2O	0.1600E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7500E 00	ABS CYC.DP,H2O	0.5200E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4850E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1420E 03	PART.CYC.EXIT	0.1450E 03	PART.INIT.GAL	0.6702E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1440E 03	PART.FINAL,GAL	0.6739E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1440E 03	PART.TIME,MIN	0.6150E 02
P.P.EXIT	0.1380E 03	ABS CYC.SUMP	0.1430E 03	ABS H2O IN.GAL	0.1393E 05
PART.CYC.SUMP	0.1390E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1397E 05
ABS CYC.SUMP	0.1390E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6150E 02
FBA SUMP	0.0	MGOH2 TANK	0.7800E 02	MGO ROTO.SCALE,%	0.9500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9500E 02
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.5600E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER F-067

DATE 3-10-70

TIME OF DAY 0220

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEM POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	510.	95.0	---	---	---	---	0.005	41.1	508.	21.7
SECONDARY AIR	4896.	633.8	---	---	---	---	0.001	6.4	4890.	11.2
FURNACE EXIT	5895.	770.0	5793.8	---	---	---	0.049	111.3	5620.	5.2
PART.SCRB.INLET	5895.	660.0	---	---	---	---	0.049	111.3	---	2.7
PART.CYC.EXIT	5911.	145.0	2561.0	---	---	---	0.138	143.2	5195.	-10.2
VENT ABS.INLET	5911.	145.0	---	---	---	---	0.138	143.2	---	-15.0
ABS CYC.EXIT	6163.	144.0	---	---	---	---	0.126	138.7	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6163.	138.0	864.9	*****	*****	*****	0.126	138.7	5473.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	56.0	5.99	56.0	5.4	*****
MAKEUP WATER	144.0	5.09	78.0	8.9	*****
PRODUCT LIQ.	144.0	23.15	143.0	15.7	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ) 143.0	504.0	*****
			REC.(FLOW NOZ.) 441.2	441.2	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.647E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	515.4
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	4.8
OXYGEN,% DRY, MEAS.	1.00
CO2,% DRY-CALC.	17.23
HUMIDITY,#/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	55.80
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	164.4
LIQ/GAS,GAL/MCF	14.2
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.4

FLOAT.BED

VENT ABS.	66.23
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 70.9

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = 8.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0295

MOL% TOTAL SULF= 2.07

O2 AT FURN.EX.= 1.00

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-067 DATE 3-10-70 TIME OF DAY 0220

MATERIAL BALANCES

FURNACE

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	-----	38.14	255.7	5609.
OUTPUT, #/HR	-----	*****	274.9	5620.

PART. SCRUBBER

INPUT, #/HR	-----	*****	3274.	5620.
OUTPUT, #/HR	-----	*****	3265.	5195.

SO2 ABSORBERS

INPUT, #/HR	23.12	*****	1535.	5195.
OUTPUT, #/HR	36.12	*****	1620.	5473.

* *SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
COMBINED	8.94	1.3969	-----	SLURRY CONC.- GM MGO/100ML = 7.25
FREE	8.94	1.3969	-----	MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	8.94	1.3969	-----	
MONO(SOLID)	*****	*****	*****	
BISULFITE	*****	*****	*****	
MGO	1.10	0.1719	0.687	
SULFATE	0.19	0.0295	0.354	
MAGNESIUM	10.23	1.5983	-----	
FLYASH	-----	-----	*****	
SOLIDS, MG	-----	-----	*****	

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.527835
HYDROGEN	0.548454
OXYGEN	1.387219
NITROGEN	5.000041
SULFUR	0.010063

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 236.

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.30

SP.GRAVITY, HYDROM. = 1.0700

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-068	CARD NUMBER	3
DATE	3-10-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	0330	N.G. STATIC, R.O.	0.9300E 01
PRI. AIR ST, HG	0.1600E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2300E 01	02 FURN. EX. %BM	0.1000E 01
SEC. AIR ST, HG	0.1600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.8000E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4150E 02	SEC. AIR ORIF.	0.6550E 03	PART. SCRUB. IN	
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	
ABS LOAD, PSIG	0.3300E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1020E 04	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9250E 03	PRI. AIR FAN IN.	0.7200E 02
		NO.2 BANK OUT	0.7800E 03	PRI. AIR WGT BULB	0.5150E 02
CARD NUMBER	7	FURN. EXIT	0.1000E 03	SEC. AIR FAN IN.	0.2600E 02
MODE OF OPER.	2	COAL-AIR		SEC. AIR WET BULB	0.2600E 02
PART. SCR. ST, HG	0.2000E 00				
PART. SCR. DP, H2O	0.6500E 01				
PART. CYC. DP, H2O	0.6000E 01				
#1 ORIF. ST, HG	-0.7500E 00				
#1 ORIF. DP, H2O	0.4850E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
ABS CYC. DP, H2O	0.5200E 01	FBA SUMP DP, H2O	0.0
		FBA DP, H2O	0.0
		FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1390E 03	TEMP. THERMOMETERS, F	0.1450E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1430E 03	PART. INIT. GAL	0.6740E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1440E 03	PART. FINAL, GAL	0.6781E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1430E 03	PART. TIME, MIN	0.6875E 02
P.P. EXIT	0.1385E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1397E 05
PART. CYC. SUMP	0.1385E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1400E 05
ABS CYC. SUMP	0.1385E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.6875E 02
FBA SUMP	0.0	MGOH2 TANK	0.6800E 02	MGO ROTO. SCALE, %	0.9400E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9400E 02
MGOH2 TANK	0.7850E 02				
MAKEUP WATER	0.5600E 02				

RUN NUMBER F-068

DATE 3-10-70

TIME OF DAY 0330

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	497.	100.0	-----	-----	-----	-----	0.004	38.6	495.	21.7
SECONDARY AIR	4892.	640.0	-----	-----	-----	-----	0.003	32.8	4876.	11.6
FURNACE EXIT	5876.	780.0	4797.2	9.2	-----	-----	0.051	112.6	5592.	5.6
PART.SCRB.INLET	5876.	655.0	-----	-----	-----	-----	0.051	112.6	-----	2.7
PART.CYC.EXIT	5910.	145.0	3328.5	-----	-----	-----	0.139	143.4	5191.	-10.2
VENT ABS.INLET	5910.	145.0	-----	-----	-----	-----	0.139	143.4	-----	-15.0
ABS CYC.EXIT	6157.	143.0	-----	-----	-----	-----	0.128	139.3	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	6157.	138.5	1040.5	-----	-----	-----	0.128	139.3	5457.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE	56.0	5.95	MAKEUP WATER	56.0	4.1	-----	-----
MAKEUP WATER	144.0	5.09	MAKEUP MGO SL.	78.5	8.8	-----	-----
PRODUCT LIQ.	144.0	23.15	PRODUCT LIQ.	143.0	14.3	-----	-----
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ)	143.0	504.0	-----	-----
-----	-----	-----	REC.(FLOW NOZ.)	455.7	455.7	-----	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.644E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	512.8
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	4.8
OXYGEN,% DRY, MEAS.	1.00
CO2,% DRY-CALC.	17.23
HUMIDITY,#/# - CALC.	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	30.62
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	164.4
LIQ/GAS,GAL/MCF	14.2
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.5

VENT ABS.

68.74

83.6
31.1
4.4
1.6

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	75.7
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	9.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	-----
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID.TIME,MIN	=	-----

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0351
MOL% TOTAL SULF=	2.57
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	0.80
O2 AT ABSORB.EX=	0.70

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-068 DATE 3-10-70 TIME OF DAY 0330

MATERIAL BALANCES

FURNACE

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	---	37.95	265.3	5580.
OUTPUT, #/HR	---	*****	284.4	5592.

PART. SCRUBBER

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	---	*****	3262.	5592.
OUTPUT, #/HR	---	*****	3268.	5191.

SO2 ABSORBERS

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	*****	*****	1495.	5191.
OUTPUT, #/HR	33.28	*****	1546.	5457.

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.527837
HYDROGEN	0.544142
OXYGEN	1.387219
NITROGEN	5.000039
SULFUR	0.010063

FEED RATE, #/SEC= 1.64

ENTHALPY, BTU/# = -594.

* #SO2 ABSORBERS-PRODUCT COMP.

GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
TOTAL,	1.3281	---
COMBINED	1.3281	---
FREE	0.0	---
MONO(TOTAL)	1.3281	---
MONO(DISSOLVED)	*****	*****
MONO(SOLID)	*****	*****
BISULFITE	*****	*****
MGO	0.2500	1.000
SULFATE	0.0351	0.421
MAGNESIUM	1.6132	---
FLYASH	---	*****
SOLIDS, MG	---	*****

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.10

SP.GRAVITY, HYDROM. = 1.0700

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* #TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-069	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1140E 02	N.G. FLOW,%SCALE	0.9900E 02
TIME	0420	BURNER DP,H2O	0.5700E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.5800E 01	SCREW SPEED,RPM	0.4250E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.1000E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5400E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.5500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4150E 02	SEC.AIR ORIF.	0.8000E 02	PART.SCRUB.IN	0.6600E 03
ABS NOZ.,PSIG	0.1700E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.2200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4900E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1045E 04	PRI.AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.9250E 03	PRI.AIR WGT BULB	0.5350E 02
CARD NUMBER	7	FURN. EXIT	0.7850E 03	SEC.AIR FAN IN.	0.2600E 02
MODE OF OPER.	2	COAL-AIR	0.1000E 03	SEC.AIR WET BULB	0.2600E 02
PART.SCR.ST,HG	0.2500E 00				
PART.SCR.DP,H2O	0.6500E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.6000E 01	VENT.ABS.DP,H2O	0.1550E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7500E 00	ABS CYC.DP,H2O	0.5100E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4850E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART.CYC.EXIT	0.1450E 03	PART.INIT.GAL	0.6780E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1430E 03	PART.FINAL,GAL	0.6809E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1440E 03	PART.TIME,MIN	0.6575E 02
P.P.EXIT	0.1375E 03	ABS CYC.SUMP	0.1430E 03	ABS H2O IN.GAL	0.1400E 05
PART.CYC.SUMP	0.1385E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1403E 05
ABS CYC.SUMP	0.1385E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6575E 02
FBA SUMP	0.0	MGOH2 TANK	0.6800E 02	MGO ROTO.SCALE,%	0.9200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9200E 02
MGOH2 TANK	0.6500E 02				
MAKEUP WATER	0.5600E 02				

DRY FLOW #/HR	STAT PRES IN. H2O
---------------------	-------------------------

DRY FLOW #/HR	STAT PRES IN. H2O
---------------------	-------------------------

VENTURI ABSORBER		FBA	
TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
56.0	4.1	***	***
65.0	8.6	***	***
143.0	15.0	***	***
143.0	454.3	***	***
	460.4	***	***

SCRUBBER PERFORMANCE		PART.
S02 ABSORB.EFF	7.00	*****
FLYASH COL.EFF		*****
S03 ABSORB.EFF		*****
NOX ABSORB.EFF		*****
GAS VELOCITY,FPS	164.2	
LIQ/GAS,GAL/MCF	14.2	
LIQ/GAS,#/#	2.0	
PRES.DROP.IN.WG	6.5	

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0392
MOL% TOTAL SULF=	3.91
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

RUN NUMBER F-069

DATE 3-10-70 TIME OF DAY 0420

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.527778
HYDROGEN 0.550762
OXYGEN 1.387215
NITROGEN 5.000097
SULFUR 0.010060

FEED RATE, #/SEC = 1.64

ENTHALPY, BTU/# = -624.

DRY GAS

WATER 265.5
FLYASH 37.94
MAGNESIUM 284.8

SULFUR 18.97
SULFUR 28.31
SULFUR 24.60

SO2 ABSORBERS
INPUT, #/HR 24.60
OUTPUT, #/HR 36.46

SO2 ABSORBERS-
PRODUCT COMP. 23.63
25.65

GM SO2/
100ML 1.0356
1.0356
0.0
1.0356

0.1106
0.0392
1.1855

GRAM/
100ML 0.442
0.471

12.984

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGO/100ML = 7.60
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 8.30
SP.GRAVITY, HYDROM. = 1.0660

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-070	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST. H2O	0.1170E 02	N.G. FLOW, %SCALE	0.9850E 02
TIME	0510	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.9300E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST. H2O	0.6000E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. % - BM	0.1000E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.5800E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BARDOMETRIC, HG	0.2884E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4150E 02	SEC. AIR ORIF.	0.8200E 02	PART. SCRUB. IN	0.6600E 03
ABS NOZ., PSIG	0.1600E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1550E 03
ABS LOAD, PSIG	0.2250E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF. INCH	0.5100E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1040E 04	PRI. AIR FAN IN.	0.7400E 02
CARD NUMBER	7	NO.2 BANK OUT	0.9300E 03	PRI. AIR WGT BULB	0.5300E 02
MODE OF OPER.	2	FURN. EXIT	0.7950E 03	SEC. AIR FAN IN.	0.2600E 02
PART. SCR. ST, HG	0.2500E 00	COAL-AIR	0.1020E 03	SEC. AIR WET BULB	0.2600E 02
PART. SCR. DP, H2O	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.1550E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.7500E 00	ABS CYC. DP, H2O	0.5200E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4900E 01	CARD NUMBER	10	FBA DP, H2O	0.0
		TEMP. PILOT RECORDER, F		FBA DEMIST. DP, H2O	0.0
		#1 ORIFICE	0.1390E 03	CARD NUMBER	11
FBA INLET	0.0	ABS CYC. EXIT	0.1450E 03	MAKEUP FLOWS	
FBA EXIT	0.0	PART. CYC. EXIT	0.1440E 03	PART. INIT. GAL	0.6810E 05
P.P. EXIT	0.1380E 03	PART. CYC. SUMP	0.1440E 03	PART. FINAL, GAL	0.6843E 05
PART. CYC. SUMP	0.1380E 03	ABS CYC. SUMP	0.1440E 03	PART. TIME, MIN	0.5450E 02
ABS CYC. SUMP	0.1390E 03	FBA SUMP	0.0	ABS H2O IN. GAL	0.1404E 05
FBA SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O FI. GAL	0.1406E 05
MGO SLAK TANK	0.0	MGOH2 TANK	0.6900E 02	ABS H2O TIME, MIN	0.5450E 02
MGOH2 TANK	0.6800E 02			MGO ROTO. SCALE, %	0.9000E 02
MAKEUP WATER	0.5600E 02			MAKEUP SETTING	0.9000E 02

RUN NUMBER F-070

DATE 3-10-70

TIME OF DAY 0510

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW PCNT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	497.	102.0	---	---	---	---	0.005	40.8	494.	21.7
SECONDARY AIR	4884.	643.8	---	---	---	---	0.003	32.8	4867.	11.7
FURNACE EXIT	5866.	795.0	5072.9	---	---	---	0.051	112.7	5582.	5.8
PART.SCRB.INLET	5866.	660.0	---	---	---	---	0.051	112.7	---	3.4
PART.CYC.EXIT	5939.	145.0	5043.1	---	---	---	0.140	143.7	5209.	-10.2
VENT ABS.INLET	5939.	145.0	---	---	---	---	0.140	143.7	---	-15.1
ABS CYC.EXIT	6162.	144.0	---	---	---	---	0.127	139.1	---	-25.7
FLOATING BED IN	---	---	---	---	---	---	---	---	---	---
FLOATING BED EX	---	---	---	---	---	---	---	---	---	---
P.P. EXIT ORIF.	6162.	138.0	1112.0	---	---	---	0.127	139.1	5467.	-25.7

SCRUBBER STREAM DATA

PARTICULATE
MAKEUP WATER
PRODUCT LIQ.
RECIRCULATED LIQ.

TEMP, F
56.0
144.0
144.0

FLOW, GPM
6.03
5.09
23.15

GAS ABSORBER
MAKEUP WATER
MAKEUP MGO SL.
PRODUCT LIQ.
REC. (SPRAY NOZ.)
REC. (FLOW NOZ.)

VENTURI ABSORBER
TEMP, F
56.0
68.0
144.0
144.0

FLOW, #/M
4.1
3.5
15.0
436.5
469.7

FRA
TEMP, F

FLOW, #/M

FURNACE PERFORMANCE
HEAT RELEASE, BTU/HR
% FUEL AS COAL
COAL FLOW RATE, #/HR
NAT. GAS FLOW, #/HR
% EXCESS AIR
OXYGEN, % DRY, MEAS.
CO2, % DRY-CALC.
HUMIDITY, #/# - CALC.

0.643E 07
96.9
511.9
8.9
4.8
1.00
17.23
0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF
FLYASH COL.EFF
SO3 ABSORB.EFF
NOX ABSORB.EFF
GAS VELOCITY, FPS
LIQ/GAS, GAL/MCF
LIQ/GAS, #/#
PRES.DROP, IN.WG

0.59

165.3
14.1
2.0
6.4

VENT ABS.

77.95

83.8
32.0
4.6
1.5

FLUAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 98.7
SULFITE/SO2-MOL/MOL = *****
SUMP RESID.TIME, MIN = 8.8

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME, MIN

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L = 0.0284
MOL% TOTAL SULF = 3.14
O2 AT FURN. EX. = 1.00
O2 AT ABSORB. IN = 0.90
O2 AT ABSORB. EX = 0.80

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-070 DATE 3-10-70 TIME OF DAY 0510

MATERIAL BALANCES

	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE					
INPUT, #/HR	18.94	-----	37.88	264.9	5571.
OUTPUT, #/HR	29.31	-----	*****	284.2	5582.
PART. SCRUBBER					
INPUT, #/HR	29.31	-----	*****	3300.	5582.
OUTPUT, #/HR	27.19	-----	*****	3279.	5209.
SO2 ABSORBERS					
INPUT, #/HR	27.19	23.23	*****	1445.	5209.
OUTPUT, #/HR	32.31	21.91	*****	1588.	5467.

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.527798
HYDROGEN	0.547978
OXYGEN	1.387216
NITROGEN	5.000077
SULFUR	0.010061

FEED RATE, #/SEC= 1.63

ENTHALPY, BTU/# = -521.

* SO2 ABSORBERS-PRODUCT COMP.

	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
TOTAL,	5.60	0.8750	-----
COMBINED	5.60	0.8750	-----
FREE	0.0	0.0	-----
MONO(TOTAL)	5.60	0.8750	-----
MONO(DISSOLVED)	*****	*****	*****
MONO(SOLID)	*****	*****	*****
BISULFITE	*****	*****	*****
MGO	0.70	0.1094	0.438
SULFATE	0.18	0.0284	0.341
MAGNESIUM	6.48	1.0128	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	*****

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.60

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 8.00

SP.GRAVITY, HYDROM. = 1.0540

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-071	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1200E 02	N.G. FLOW,%SCALE	0.9900E 02
TIME	0615	BURNER DP,H2O	0.5700E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1500E 01	FURN. ST,H2O	0.6000E 01	SCREW SPEED,RPM	0.4250E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.2000E 01	02 FURN.EX.%-BM	0.1000E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.5800E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.6000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2883E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.8200E 02	TEMP.CONTINUED	0.6900E 03
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.1600E 03
ABS NOZ.,PSIG	0.1400E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.0
ABS LOAD,PSIG	0.2000E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.7000E 03
ABS ORIF.INCH	0.5000E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1058E 04	AIR HEATER #2	0.7300E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.9350E 03	PRI.AIR FAN IN.	0.5500E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8000E 03	PRI.AIR WGT BULB	0.2600E 02
MODE OF OPER.	2	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.2600E 02
PART.SCR.ST,HG	0.3000E 00	COAL-AIR		SEC.AIR WET BULB	0.2600E 02
PART.SCR.DP,H2O	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.6000E 01	VENT.ABS.DP,H2O	0.1500E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.6000E 00	ABS CYC.DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4600E 01			FBA DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	FBA DEMIST.DP,H2O	0.0
TEMP.PILOT RECORDER,F	0.8000E 02	TEMP.THERMOMETERS,F	0.1460E 03	CARD NUMBER	12
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1440E 03	MAKEUP FLOWS	0.6843E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1450E 03	PART.INIT.GAL	0.6879E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1440E 03	PART.FINAL,GAL	0.6000E 02
P.P.EXIT	0.1390E 03	ABS CYC.SUMP	0.0	PART.TIME,MIN	0.1406E 05
PART.CYC.SUMP	0.1380E 03	FBA SUMP	0.0	ABS H2O IN.GAL	0.1409E 05
ABS CYC.SUMP	0.1390E 03	MGO SLAK TANK	0.0	ABS H2O FI.GAL	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.0	ABS H2O TIME,MIN	0.9000E 02
MGO SLAK TANK	0.0			MGO ROTO.SCALE,%	0.9000E 02
MGOH2 TANK	0.7800E 02			MAKEUP SETTING	0.9000E 02
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER F-071

DATE 3-10-70 TIME OF DAY 0615

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	503.	110.0	---	---	---	---	0.006	47.4	500.	20.3
SECONDARY AIR	4883.	645.0	---	---	---	---	0.003	32.8	4867.	12.0
FURNACE EXIT	5872.	800.0	5517.5	---	---	---	0.051	112.8	5587.	6.0
PART.SCRB.INLET	5872.	690.0	---	---	---	---	0.051	112.8	---	4.1
PART.CYC.EXIT	5752.	146.0	5517.5	---	---	---	0.148	145.7	5008.	-8.1
VENT ABS.INLET	5752.	146.0	---	---	---	---	0.148	145.7	---	-12.7
ABS CYC.EXIT	6351.	144.0	---	---	---	---	0.137	141.3	---	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6351.	139.0	1015.8	*****	*****	*****	0.137	141.3	5585.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	6.03	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	145.0	5.09	MAKEUP MGO SL.	3.9	3.9
PRODUCT LIQ.	145.0	23.15	PRODUCT LIQ.	8.5	8.5
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	14.3	14.3
			REC.(FLOW NOZ.)	398.4	398.4
				465.1	465.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.643E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	512.3
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	4.8
OXYGEN,% DRY, MEAS.	1.00
CO2,% DRY-CALC.	17.23
HUMIDITY,#/# - CALC.	0.051

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	112.8
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	9.2

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-0.0
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	160.2
LIQ/GAS,GAL/MCF	14.6
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	*****
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

FLOAT.BED

VENT ABS.

81.59	*****
*****	*****
*****	*****
*****	*****
87.1	*****
30.5	*****
4.4	*****
1.5	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-071

DATE 3-10-70

TIME OF DAY 0615

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE

INPUT, #/HR 18.95
OUTPUT, #/HR 31.91

WATER 265.8

FLYASH 37.91

DRY GAS 5576.

5587.

PART. SCRUBBER

INPUT, #/HR 31.91
OUTPUT, #/HR 28.60

5587.

5008.

SO2 ABSORBERS

INPUT, #/HR 28.60
OUTPUT, #/HR 39.86

5008.

5585.

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 7.92

COMBINED 7.92

FREE 0.0

MONO(TOTAL) 7.92

MONO(DISSOLVED) *****

MONO(SOLID) *****

BISULFITE *****

MGO 0.88

SULFATE *****

MAGNESIUM 8.80

FLYASH -----

SOLIDS, MG -----

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 7.60

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 8.00

SP.GRAVITY, HYDROM. = 1.0680

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

OXY+NIT 0.0817

SULFUR 0.0370

ASH 0.0740

WATER 0.0438

*

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-072	CARD NUMBER	3
DATE	3-10-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	0725	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1500E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2400E 01	02 FURN. EX. %BM	0.1000E 01
SEC. AIR ST, HG	0.1600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BARDMETRIC, HG	0.2883E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.8000E 02	TEMP. CONTINUED	0.7000E 03
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.1400E 03
ABS NOZ., PSIG	0.1500E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.0
ABS LOAD, PSIG	0.2100E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.7000E 03
ABS ORIF. INCH	0.5000E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1078E 04	AIR HEATER #2	0.7900E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.9500E 03	PRI. AIR FAN IN.	0.5800E 02
		NO.2 BANK OUT	0.8000E 03	PRI. AIR WGT BULB	0.2600E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC. AIR FAN IN.	0.2600E 02
MODE OF OPER.	2	COAL-AIR		SEC. AIR WET BULB	0.2600E 02
PART. SCR. ST, HG	0.3000E 00				
PART. SCR. DP, H2O	0.6400E 01				
PART. CYC. DP, H2O	0.6000E 01				
#1 ORIF. ST, HG	-0.6000E 00				
#1 ORIF. DP, H2O	0.4600E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
ABS CYC. DP, H2O	0.5000E 01	FBA SUMP DP, H2O	0.0
		FBA DP, H2O	0.0
		FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1430E 03	TEMP. THERMOMETERS, F	0.1460E 03	MAKEUP FLOWS	0.6879E 05
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1450E 03	PART. INIT. GAL	0.6920E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1450E 03	PART. FINAL, GAL	0.6000E 02
FBA EXIT	0.0	PART. CYC. SUMP	0.1430E 03	PART. TIME, MIN	0.1409E 05
P.P. EXIT	0.1380E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1412E 05
PART. CYC. SUMP	0.1390E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.6000E 02
ABS CYC. SUMP	0.1400E 03	MGO SLAK TANK	0.7200E 02	ABS H2O TIME, MIN	0.9100E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO. SCALE, %	0.9100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9100E 02
MGOH2 TANK	0.7000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER F-072

DATE 3-10-70

TIME OF DAY 0725

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	503.	110.0					0.006	49.4	499.	20.3
SECONDARY AIR	4892.	645.0					0.003	32.8	4876.	12.0
FURNACE EXIT	5882.	800.0	3286.9				0.051	112.8	5596.	6.0
PART.SCRB.INLET	5882.	700.0					0.051	112.8		4.1
PART.CYC.EXIT	5743.	146.0	5478.1				0.155	147.0	4973.	-8.1
VENT ABS.INLET	5743.	146.0					0.155	147.0		-12.7
ABS CYC.EXIT	6125.	145.0					0.142	142.4		-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	6125.	138.0	1259.7				0.142	142.4	5362.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	6.68		60.0 3.5	*****
MAKEUP WATER	145.0	5.09	MAKEUP MGO SL.	70.0 8.6	*****
PRODUCT LIQ.	145.0	23.15	PRODUCT LIQ.	143.0 14.3	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	143.0 417.9	*****
			REC.(FLOW NOZ.)	465.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.644E 07
% FUEL AS COAL	97.0
COAL FLOW RATE,#/HR	513.3
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	4.8
OXYGEN,% DRY, MEAS.	1.00
CO2,% DRY-CALC.	17.23
HUMIDITY,#/# - CALC.	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-66.67
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	160.5
LIQ/GAS,GAL/MCF	14.5
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.4

VENT ABS.

77.00	*****
*****	*****
*****	*****
*****	*****
84.4	*****
31.5	*****
4.6	*****
1.6	*****

VENT ABS.

*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	94.1
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	9.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	*****
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-072 DATE 3-10-70 TIME OF DAY 0725 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	18.99	---	37.98	266.6	5585.
OUTPUT, #/HR	19.04	---	*****	285.6	5596.
PART. SCRUBBER					
INPUT, #/HR	19.04	---	*****	3630.	5596.
OUTPUT, #/HR	28.20	---	*****	3319.	4973.
SO2 ABSORBERS					
INPUT, #/HR	28.20	*****	*****	1494.	4973.
OUTPUT, #/HR	39.86	27.21	*****	1617.	5362.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
COMBINED	7.66	1.1969	---
FREE	7.66	1.1969	---
MONO(TOTAL)	0.0	0.0	---
MONO(DISSOLVED)	7.66	1.1969	---
MONO(SOLID)	*****	*****	*****
BISULFITE	*****	*****	*****
MGO	0.78	0.1219	0.487
SULFATE	*****	*****	*****
MAGNESIUM	8.44	1.3187	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	*****

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	*****
MGO PRESLAKED, NO=0, YES=1	0
% SLAKED TO MG(OH)2, MEAS. =	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	8.00
SP.GRAVITY, HYDROM. =	1.0680

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	*****
FLYASH CONC. GM/100ML =	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-073	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST, H2O	0.1200E 02	N.G. FLOW, %SCALE	0.9900E 02
TIME	0815	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.D.	0.8000E 01
PRI. AIR ST, HG	0.1500E 01	FURN. ST, H2O	0.7000E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. % - BM	0.1100E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.5200E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.6000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2850E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.6500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.7000E 03
ABS NOZ., PSIG	0.1500E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1600E 03
ABS LOAD, PSIG	0.2100E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF. INCH	0.5000E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1050E 04	PRI. AIR FAN IN.	0.7900E 02
		NO.2 BANK OUT	0.9500E 03	PRI. AIR WGT BULB	0.5800E 02
		FURN. EXIT	0.8000E 03	SEC. AIR FAN IN.	0.2600E 02
CARD NUMBER	7	COAL-AIR	0.1100E 03	SEC. AIR WET BULB	0.2500E 02
MODE OF OPER.	2				

CARD NUMBER	8	CARD NUMBER	9
PART. SCR. ST, HG	0.3000E 00	FBA INLET ST, HG	0.0
PART. SCR. DP, H2O	0.6600E 01	FBA SUMP DP, H2O	0.0
PART. CYC. DP, H2O	0.6000E 01	FBA DP, H2O	0.0
#1 ORIF. ST, HG	-0.7000E 00	FBA DEMIST. DP, H2O	0.0
#1 ORIF. DP, H2O	0.4600E 01		

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1430E 03	TEMP. THERMOMETERS, F	0.1460E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1460E 03	PART. INIT. GAL	0.6920E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1460E 03	PART. FINAL, GAL	0.6949E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1460E 03	PART. TIME, MIN	0.5000E 02
P.P. EXIT	0.1380E 03	ABS CYC. SUMP	0.1440E 03	ABS H2O IN. GAL	0.1412E 05
PART. CYC. SUMP	0.1380E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1414E 05
ABS CYC. SUMP	0.1380E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.5000E 02
FBA SUMP	0.0	MGOH2 TANK	0.7000E 02	MGO ROTO. SCALE, %	0.9200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9200E 02
MGOH2 TANK	0.7000E 02				
MAKEUP WATER	0.6000E 02				

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	500.	110.0	---	---	---	---	0.007	49.6	497.	20.3
SECONDARY AIR	4935.	645.0	---	---	---	---	0.003	30.2	4920.	12.0
FURNACE EXIT	5923.	800.0	5731.3	***	***	***	0.051	112.1	5638.	6.0
PART.SCRB.INLET	5923.	700.0	***	***	***	***	0.051	112.1	---	4.1
PART.CYC.EXIT	5706.	146.0	5261.5	***	***	***	0.150	145.4	4963.	-9.5
VENT ABS.INLET	5706.	146.0	***	***	***	***	0.150	145.4	---	-14.1
ABS CYC.EXIT	5992.	146.0	***	***	***	***	0.137	140.9	---	-25.7
FLOATING BED IN	*****	*****	***	***	***	***	*****	*****	---	*****
FLOATING BED EX	*****	*****	***	***	***	***	*****	*****	---	*****
P.P. EXIT ORIF.	5992.	138.0	1225.7	***	***	***	0.137	140.9	5269.	-25.7

SCRUBBER STREAM DATA

SCRUBBER STREAM DATA			VENTURI ABSORBER			FBA
	TEMP, F	FLOW, GPM		TEMP, F	FLOW, #/M	
PARTICULATE			GAS ABSORBER			
MAKEUP WATER	60.0	5.92	MAKEUP WATER	60.0	3.8	*****
PRODUCT LIQ.	146.0	5.09	MAKEUP MGO SL.	70.0	8.6	*****
RECIRCULATED LIQ.	146.0	23.15	PRODUCT LIQ.	144.0	14.3	*****
			REC. (SPRAY NOZ)	144.0	417.9	*****
			REC. (FLOW NOZ.)		465.1	*****

FURNACE PERFORMANCE

FURNACE PERFORMANCE
HEAT RELEASE, BTU/HR
% FUEL AS COAL
COAL FLOW RATE, #/HR
NAT. GAS FLOW, #/HR
% EXCESS AIR
OXYGEN, % DRY, MEAS.
CO₂, % DRY-CALC.
HUMIDITY, #/# - CALC.

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT ² ,	=	91.7
SULFITE/SO ₂ -MOL/MOL	=	*****
SUMP RESID.TIME, MIN	=	9.2

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

FLOATING BED ABSORBER

```

KGA, #MOLE/HR-FT2      =
SULFITE/SO2-MOL/MOL    =
SUMP RESID.TIME,MIN     =

```

SULFATE FORMATION PARAMETERS

```

CONC.,GM-MOLE/L=
MOL% TOTAL SULF=
02 AT FURN. EX.=
02 AT ABSORB.IN.=
02 AT ABSORB.EX.=
1.10

```

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-073	DATE 3-10-70	TIME OF DAY 0815	INPUT FOR EQ. - KIN.PROG.	
MATERIAL BALANCES			INPUT FLOWS, #ATOMS/100#FEED	
FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER
INPUT, #/HR	19.04	---	38.09	266.0
OUTPUT, #/HR	33.46	---	*****	285.1
PART. SCRUBBER				
INPUT, #/HR	33.46	---	*****	3250.
OUTPUT, #/HR	27.04	---	*****	3292.
SO2 ABSORBERS				
INPUT, #/HR	27.04	*****	*****	1490.
OUTPUT, #/HR	38.44	27.21	*****	1576.
*SO2 ABSORBERS-PRODUCT COMP.			MAKEUP MGO COMPOSITION	
TOTAL,	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	SLURRY CONC.- GM MGO/100ML =
COMBINED	7.40	1.1562	---	MGO PRESLAKED, NO=0, YES=1
FREE	7.40	1.1562	---	% SLAKED TO MG(OH)2, MEAS. =
MONO(TOTAL)	0.0	0.0	---	PRODUCT MG BASE PHYSICAL PROPERTIES
MONO(DISSOLVED)	7.40	1.1562	---	ACID STRENGTH, PH =
MONO(SOLID)	*****	*****	*****	SP.GRAVITY, HYDROM. =
BISULFITE	*****	*****	*****	
MGO	1.04	0.1625	0.650	
SULFATE	*****	*****	*****	
MAGNESIUM	8.44	1.3187	---	
FLYASH	---	---	*****	
SOLIDS, MG	---	---	*****	

FEED RATE, #/SEC= 1.65		ENTHALPY, BTU/# = -364.	
COAL COMPOSITION-MASS			
CARBON	0.7150		
HYDROGEN	0.0485		
OXY+NIT	0.0817		
SULFUR	0.0370		
ASH	0.0740		
WATER	0.0438		
PARTICULATE SCRUBBER PRODUCT			
ACID STRENGTH, PH =		*****	
FLYASH CONC. GM/100ML =		*****	

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-074	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1200E 02	N.G. FLOW,%SCALE	0.9900E 02
TIME	0915	BURNER DP,H2O	0.5500E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.6500E 01	SCREW SPEED,RPM	0.4250E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX,%-BM	0.1000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5200E 01	COMB.FURN.EX,%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.6000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2885E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4210E 02	SEC.AIR ORIF.	0.9000E 02	PART.SCRUB.IN	0.7030E 03
ABS NOZ.,PSIG	0.1500E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1600E 03
ABS LOAD,PSIG	0.2100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.5000E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1080E 04	PRI.AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.9500E 03	PRI.AIR WGT BULB	0.5800E 02
CARD NUMBER	7	FURN. EXIT	0.8050E 03	SEC.AIR FAN IN.	0.2600E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.2600E 02
PART.SCR.ST,HG	0.3000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.6400E 01	VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.6000E 01	ABS CYC.DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.7000E 00			FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4800E 01			FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1430E 03	PART.CYC.EXIT	0.1480E 03	PART.INIT.GAL	0.6949E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1450E 03	PART.FINAL,GAL	0.6985E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1460E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1380E 03	ABS CYC.SUMP	0.1440E 03	ABS H2O IN.GAL	0.1414E 05
PART.CYC.SUMP	0.1380E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1417E 05
ABS CYC.SUMP	0.1360E 03	MGO SLAK TANK	0.6500E 02	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.7000E 02	MGO ROTO.SCALE,%	0.9200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9200E 02
MGOH2 TANK	0.7400E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER F-074

DATE 3-10-70

TIME OF DAY 0915

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	493.	110.0	---	---	---	---	0.007	53.4	489.	21.7
SECONDARY AIR	4833.	642.5	---	---	---	---	0.003	32.7	4817.	12.0
FURNACE EXIT	5806.	805.0	4979.6	---	---	---	0.051	112.9	5524.	6.0
PART.SCRB.INLET	5806.	703.0	---	---	---	---	0.051	112.9	---	4.1
PART.CYC.EXIT	5855.	148.0	5227.0	---	---	0.0460	0.150	146.0	5091.	-9.5
VENT ABS.INLET	5855.	148.0	---	---	---	---	0.150	146.0	---	-14.3
ABS CYC.EXIT	6042.	145.0	---	---	---	---	0.138	141.8	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6042.	138.0	1136.3	*****	*****	0.0303	0.138	141.8	5308.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	TEMP,F	VENTURI ABSORBER TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE	60.0	5.94	---	60.0	4.2	---	---	---
MAKEUP WATER	146.0	5.09	---	74.0	8.6	---	---	---
PRODUCT LIQ.	146.0	23.15	---	144.0	15.0	---	---	---
RECIRCULATED LIQ.	---	---	---	REC.(SPRAY NOZ)	417.9	---	---	---
---	---	---	---	REC.(FLOW NOZ.)	465.1	---	---	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.636E 07
% FUEL AS COAL	96.9
COAL FLOW RATE,#/HR	506.4
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	4.8
OXYGEN,% DRY, MEAS.	1.00
CO2,% DRY-CALC.	17.22
HUMIDITY,#/# - CALC.	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-4.97
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	164.2
LIQ/GAS,GAL/MCF	14.2
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.4

VENT ABS.

VENT ABS.	78.26
---	34.15
---	*****
---	*****
---	82.4
---	32.2
---	4.6
---	1.4

FLOAT.BED

FLOAT.BED	*****
---	*****
---	*****
---	*****
---	*****
---	*****
---	*****
---	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	96.7
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	8.8

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0688
MOL% TOTAL SULF=	5.35
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-074 DATE 3-10-70 TIME OF DAY 0915 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	---	37.47	263.4	5513.
OUTPUT, #/HR	---	*****	282.7	5524.

PART. SCRUBBER

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	---	*****	3254.	5524.
OUTPUT, #/HR	---	*****	3313.	5091.

SO2 ABSORBERS

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	*****	0.39	1532.	5091.
OUTPUT, #/HR	31.44	0.27	1620.	5308.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.527736
HYDROGEN	0.576142
OXYGEN	1.387211
NITROGEN	5.000137
SULFUR	0.010058

FEED RATE, #/SEC= 1.62

ENTHALPY, BTU/# = -666.

* *SO2 ABSORBERS-PRODUCT COMP.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	*****
MGO PRESLAKED, NO=0, YES=1	0
% SLAKED TO MG(OH)2, MEAS. =	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	8.50
SP.GRAVITY, HYDROM. =	1.0660

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	*****
FLYASH CONC. GM/100ML =	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-075	CARD NUMBER	3
DATE	3-10-70	N.G. FLOW, %SCALE	0.9900E 02
TIME	1015	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1500E 01	SCREW SPEED, RPM	0.4250E 03
PRI. AIR DP, H2O	0.2300E 01	02 FURN. EX. % - BM	0.1000E 01
SEC. AIR ST, HG	0.1600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2887E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.9000E 02	PART. SCRUB. IN	0.7080E 03
ABS NOZ., PSIG	0.1500E 02	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1600E 03
ABS LOAD, PSIG	0.2100E 02	WINDBOX-WEST	0.6200E 03	FBA INLET	0.0
ABS ORIF. INCH	0.5000E 01	WINDBOX-BOT.	0.6200E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.1090E 04	PRI. AIR FAN IN.	0.7700E 02
		NO. 2 BANK OUT	0.9550E 03	PRI. AIR WGT BULB	0.5700E 02
		FURN. EXIT	0.8050E 03	SEC. AIR FAN IN.	0.2600E 02
		COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.2600E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	2	VENT. ABS. DP, H2O	0.1400E 01	FBA INLET ST, HG	0.0
PART. SCR. ST, HG	0.3000E 00	ABS CYC. DP, H2O	0.5000E 01	FBA SUMP DP, H2O	0.0
PART. SCR. DP, H2O	0.6400E 01			FBA DP, H2O	0.0
PART. CYC. DP, H2O	0.6000E 01			FBA DEMIST. DP, H2O	0.0
#1 ORIF. ST, HG	-0.6000E 00				
#1 ORIF. DP, H2O	0.4800E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1410E 03	PART. CYC. EXIT	0.1465E 03	PART. INIT. GAL	0.6985E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1460E 03	PART. FINAL, GAL	0.7029E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1460E 03	PART. TIME, MIN	0.7000E 02
P.P. EXIT	0.1390E 03	ABS CYC. SUMP	0.1460E 03	ABS H2O IN. GAL	0.1417E 05
PART. CYC. SUMP	0.1390E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1421E 05
ABS CYC. SUMP	0.1390E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.7000E 02
FBA SUMP	0.0	MGOH2 TANK	0.7000E 02	MGO ROTO. SCALE, %	0.9000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9000E 02
MGOH2 TANK	0.7000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER F-075

DATE 3-10-70

TIME OF DAY 1015

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	492.	110.0	---	---	---	---	0.006	48.7	489.	20.3
SECONDARY AIR	4851.	633.8	---	---	---	---	0.003	32.8	4834.	13.0
FURNACE EXIT	5825.	805.0	5834.2	---	---	---	0.051	112.9	5542.	7.0
PART.SCRB.INLET	5825.	708.0	---	---	---	---	0.051	112.9	---	4.1
PART.CYC.EXIT	5869.	146.5	5703.8	---	---	---	0.154	146.9	5086.	-8.1
VENT ABS.INLET	5869.	146.5	---	---	---	---	0.154	146.9	---	-12.9
ABS CYC.EXIT	6253.	146.0	---	---	---	---	0.140	142.1	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6253.	139.0	1184.6	*****	*****	*****	0.140	142.1	5486.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	FBA
PARTICULATE	60.0	6.28	MAKEUP WATER	60.0	4.4	*****
MAKEUP WATER	146.0	5.09	MAKEUP MGO SL.	70.0	8.5	*****
PRODUCT LIQ.	146.0	23.15	PRODUCT LIQ.	146.0	15.7	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	146.0	417.9	*****
			REC.(FLOW NOZ.)		465.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.638E 07	SO2 ABSORB.EFF	2.23	VENT ABS.	79.23	FLOAT.BED	*****
% FUEL AS COAL	96.9	FLYASH COL.EFF	*****	*****	*****	*****	*****
COAL FLOW RATE,#/HR	508.1	SO3 ABSORB.EFF	*****	*****	*****	*****	*****
NAT.GAS FLOW,#/HR	8.9	NOX ABSORB.EFF	*****	*****	*****	*****	*****
% EXCESS AIR	4.8	GAS VELOCITY,FPS	163.8	85.7	31.0	*****	*****
OXYGEN,% DRY, MEAS.	1.00	LIQ/GAS,GAL/MCF	14.2	4.5	1.4	*****	*****
CO2,% DRY-CALC.	17.22	LIQ/GAS,#/#	2.0	*****	*****	*****	*****
HUMIDITY,#/# - CALC.	0.051	PRES.DROP,IN.WG	6.4	*****	*****	*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	102.9	KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****	SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	8.4	SUMP RESID.TIME,MIN	=	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0618
MOL% TOTAL SULF=	5.02
O2 AT FURN.EX.=	1.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-075 DATE 3-10-70 TIME OF DAY 1015

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	---	37.60	263.8	5531.
OUTPUT, #/HR	---	*****	283.0	5542.

PART. SCRUBBER

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	---	*****	3427.	5542.
OUTPUT, #/HR	---	*****	3332.	5086.

SO2 ABSORBERS

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	25.06	*****	1513.	5086.
OUTPUT, #/HR	31.55	*****	1694.	5486.

* SO2 ABSORBERS-PRODUCT COMP.

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	25.06	*****	1513.	5086.
OUTPUT, #/HR	31.55	*****	1694.	5486.

FEED RATE, #/SEC = 1.62

ENTHALPY, BTU/# = -804.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.527753
HYDROGEN	0.564311
OXYGEN	1.387213
NITROGEN	5.000121
SULFUR	0.010059

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML	=	8.20
MGO PRESLAKED, NO=0, YES=1	=	0
% SLAKED TO MG(OH)2, MEAS.	=	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	=	8.20
SP. GRAVITY, HYDROM.	=	1.0680

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	=	*****
FLYASH CONC. GM/100ML	=	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-076	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1150E 02	N.G. FLOW,%SCALE	0.9900E 02
TIME	1115	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.6000E 01	SCREW SPEED,RPM	0.4250E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX,%-BM	0.1000E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H2O	0.5200E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX,ST,H2O	0.6500E 01	ELE.CHEM,MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2882E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	0.7150E 03
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB-IN	0.1600E 03
ABS NOZ.,PSIG	0.1500E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.0
ABS LOAD,PSIG	0.2100E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.7000E 03
ABS ORIF.INCH	0.5000E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1100E 04	AIR HEATER #2	0.7400E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.9800E 03	PRI.AIR FAN IN.	0.5300E 02
		NO.2 BANK OUT	0.8200E 03	PRI.AIR WGT BULB	0.0
		FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.0
		COAL-AIR		SEC.AIR WET BULB	0.0

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	2	VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
PART.SCR.ST,HG	0.3000E 00	ABS CYC.DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
PART.SCR.DP,H2O	0.6400E 01			FBA DP,H2O	0.0
PART.CYC.DP,H2O	0.5900E 01			FBA DEMIST.DP,H2O	0.0
#1 ORIF.ST,HG	0.7000E 00				
#1 ORIF.DP,H2O	0.4600E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1430E 03	TEMP.THERMOMETERS,F	0.1470E 03	MAKEUP FLOWS	0.7029E 05
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1460E 03	PART.INIT.GAL	0.7064E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1460E 03	PART.FINAL,GAL	0.6000E 02
FBA EXIT	0.0	PART.CYC.SUMP	0.1460E 03	PART.TIME,MIN	0.1421E 05
P.P.EXIT	0.1400E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1423E 05
PART.CYC.SUMP	0.1400E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.6000E 02
ABS CYC.SUMP	0.1400E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.9100E 02
FBA SUMP	0.0	MGOH2 TANK	0.7200E 02	MGO ROTO.SCALE,%	0.9100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9100E 02
MGOH2 TANK	0.7000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER F-076

DATE 3-10-70

TIME OF DAY 1115

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	493.	110.0	---	---	---	---	0.005	40.8	491.	21.7
SECONDARY AIR	4858.	637.5	---	---	---	---	0.001	6.5	4852.	11.5
FURNACE EXIT	5835.	820.0	4930.1	---	543.	4.0075	0.049	111.4	5563.	6.5
PART.SCRB.INLET	5835.	715.0	-----	-----	-----	-----	0.049	111.4	---	4.1
PART.CYC.EXIT	5872.	147.0	5838.8	-----	111.	-----	0.152	148.2	5098.	9.5
VENT ABS.INLET	5872.	147.0	-----	-----	-----	-----	0.152	148.2	---	4.9
ABS CYC.EXIT	6019.	146.0	-----	-----	-----	-----	0.137	141.4	---	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	---	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	---	-----
P.P. EXIT ORIF.	6019.	140.0	-----	-----	618.	-----	0.137	141.4	5292.	-25.7

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP, F FLOW, #/M	FBA TEMP, F FLOW, #/M
PARTICULATE	60.0	5.86	---	60.0 2.8	-----
MAKEUP WATER	146.0	4.99	---	70.0 8.6	-----
PRODUCT LIQ.	146.0	23.15	---	146.0 15.4	-----
RECIRCULATED LIQ.	---	---	---	417.9 465.1	-----

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.641E 07
% FUEL AS COAL	96.9
COAL FLOW RATE, #/HR	510.0
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	4.8
OXYGEN, % DRY, MEAS.	1.00
CO2, % DRY-CALC.	17.22
HUMIDITY, #/# - CALC.	0.049

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FI2,	= -906.7
SULFITE/SO2-MOL/MOL	= -----
SUMP RESID.TIME, MIN	= 8.6

*** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-18.43
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	79.57
GAS VELOCITY, FPS	156.9
LIQ/GAS, GAL/MCF	14.9
LIQ/GAS, #/#	2.0
PRES.DROP, IN.WG	6.4

FLOATING BED ABSORBER

KGA, #MOLE/HR-FI2	= -----
SULFITE/SO2-MOL/MOL	= -----
SUMP RESID.TIME, MIN	= -----

FLOAT.BED

VENT ABS.	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----
-----	-----

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	-----
MOL% TOTAL SULF=	-----
O2 AT FURN. EX.=	1.00
O2 AT ABSORB.IN=	-----
O2 AT ABSORB.EX=	-----

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-076 DATE 3-10-70 TIME OF DAY 1115 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	18.87	---	37.74	253.0	5552.
OUTPUT, #/HR	28.39	---	36.98	272.2	5563.
PART. SCRUBBER					
INPUT, #/HR	28.39	---	36.98	3206.	5563.
OUTPUT, #/HR	30.81	---	*****	3271.	5098.
SO2 ABSORBERS					
INPUT, #/HR	30.81	*****	*****	1456.	5098.
OUTPUT, #/HR	*****	29.79	*****	1645.	5292.

FEED RATE, #/SEC = 1.63 ENTHALPY, BTU/# = 388.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION
COMBINED	7.62	1.1906	---	SLURRY CONC.- GM MGO/100ML = *****
FREE	7.62	1.1906	---	MGO PRESLAKED, NO=0, YES=1 *****
MONO(TOTAL)	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	7.62	1.1906	---	
MONO(SOLID)	*****	*****	*****	
BISULFITE	*****	*****	*****	
MGO	0.96	0.1500	0.600	
SULFATE	*****	*****	*****	
MAGNESIUM	8.58	1.3406	---	
FLYASH	---	---	---	
SOLIDS, MG	---	---	---	

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 8.20

SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-077	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1200E 02	N.G. FLW,%SCALE	0.9800E 02
TIME	1530	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.8500E 01
PRI.AIR ST, HG	0.1500E 01	FURN. ST,H2O	0.7500E 01	SCREW SPEED,RPM	0.4170E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.2000E 01
SEC.AIR ST,HG	0.7600E 01	PP EXIT DP,H2O	0.5200E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.6000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2884E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6400E 03	PART.SCRUB.IN	0.7150E 03
ABS NOZ.,PSIG	0.0	WINDBOX-TOP	0.6150E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.3800E 02	WINDBOX-WEST	0.6150E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6150E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE		WINDBOX-EAST	0.6300E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE		NO.1 BANK OUT	0.1160E 04	PRI.AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.1010E 04	PRI.AIR WGT BULB	0.7400E 02
		FURN. EXIT	0.8500E 03	SEC.AIR FAN IN.	0.2600E 02
		COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.2600E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.		VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
PART.SCR.ST,HG	0.3000E 00	ABS CYC.DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
PART.SCR.DP,H2O	0.6400E 01			FBA DP,H2O	0.0
PART.CYC.DP,H2O	0.5900E 01			FBA DEMIST.DP,H2O	0.0
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4600E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1440E 03	PART.CYC.EXIT	0.1470E 03	PART.INIT.GAL	0.7029E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1460E 03	PART.FINAL,GAL	0.7064E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1460E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1400E 03	ABS CYC.SUMP	0.1460E 03	ABS H2O IN.GAL	0.1421E 05
PART.CYC.SUMP	0.1400E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1423E 05
ABS CYC.SUMP	0.1400E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.0	MGO ROTO.SCALE,%	0.8100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.8100E 02
MGOH2 TANK	0.7000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER F-077

DATE 3-10-70

TIME OF DAY 1530

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	490.	110.0	----	----	----	----	0.019	80.0	481.	20.3
SECONDARY AIR	5305.	625.0	----	----	----	----	0.003	37.6	5287.	12.0
FURNACE EXIT	6292.	850.0	*****	*****	*****	*****	0.050	111.8	5994.	6.0
PART.SCRB.INLET	6292.	715.0	*****	*****	*****	*****	0.050	111.8	----	4.1
PART.CYC.EXIT	5722.	147.0	*****	*****	*****	*****	0.154	146.7	4958.	-9.5
VENT ABS.INLET	5722.	147.0	*****	*****	*****	*****	0.154	146.7	----	-14.1
ABS CYC.EXIT	6010.	146.0	*****	*****	*****	*****	0.139	141.8	----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	----	*****
P.P. EXIT ORIF.	6010.	140.0	*****	*****	*****	*****	0.139	141.8	5276.	-25.7

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FBA		
	TEMP, F	FLOW, GPM	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
PARTICULATE	60.0	5.86	60.0	2.8	***	***
MAKEUP WATER	146.0	5.09	70.0	7.8	***	***
PRODUCT LIQ.	146.0	23.15	146.0	15.1	***	***
RECIRCULATED LIQ.			REC. (SPRAY NOZ)	0.0	***	***
			REC. (FLOW NOZ.)	0.0	***	***

FURNACE PERFORMANCE

FURNACE PERFORMANCE		SCRUBBER PERFORMANCE		PART.	VENT ABS.	FLOAT.BED
HEAT RELEASE,BTU/HR	0.658E 07	SO2 ABSORB.EFF		*****	*****	*****
% FUEL AS COAL	97.0	FLYASH COL.EFF		*****	*****	*****
COAL FLOW RATE,#/HR	524.3	SO3 ABSORB.EFF		*****	*****	*****
NAT.GAS FLOW,#/HR	8.9	NOX ABSORB.EFF		*****	*****	*****
% EXCESS AIR	9.5	GAS VELOCITY,FPS		161.1	82.7	*****
OXYGEN,%DRY,MEAS.	2.00	LIQ/GAS,GAL/MCF		14.5	0.0	*****
CO2,%DRY-CALC.	16.37	LIQ/GAS,#/#		2.0	0.0	*****
HUMIDITY,#/# - CALC.	0.050	PRES.DROP,IN.WG		6.4	1.4	*****

SO₂ ABSORPTION PARAMETERS

ABSORPTION PARAMETERS VENTURI ABSORBER	FLOATING BED ABSORBER	SULFATE FORMATION PARAMETERS
1. SO_2 absorption rate 2. SO_2 absorption efficiency 3. SO_2 absorption capacity 4. SO_2 absorption temperature 5. SO_2 absorption pressure 6. SO_2 absorption liquid flow rate 7. SO_2 absorption gas flow rate 8. SO_2 absorption gas composition 9. SO_2 absorption liquid composition 10. SO_2 absorption liquid pH 11. SO_2 absorption liquid viscosity 12. SO_2 absorption liquid surface tension 13. SO_2 absorption liquid density 14. SO_2 absorption liquid specific heat 15. SO_2 absorption liquid thermal conductivity 16. SO_2 absorption liquid thermal expansion coefficient 17. SO_2 absorption liquid thermal stability 18. SO_2 absorption liquid thermal decomposition temperature 19. SO_2 absorption liquid thermal decomposition products 20. SO_2 absorption liquid thermal decomposition rate	1. SO_2 absorption rate 2. SO_2 absorption efficiency 3. SO_2 absorption capacity 4. SO_2 absorption temperature 5. SO_2 absorption pressure 6. SO_2 absorption liquid flow rate 7. SO_2 absorption gas flow rate 8. SO_2 absorption gas composition 9. SO_2 absorption liquid composition 10. SO_2 absorption liquid pH 11. SO_2 absorption liquid viscosity 12. SO_2 absorption liquid surface tension 13. SO_2 absorption liquid density 14. SO_2 absorption liquid specific heat 15. SO_2 absorption liquid thermal conductivity 16. SO_2 absorption liquid thermal expansion coefficient 17. SO_2 absorption liquid thermal stability 18. SO_2 absorption liquid thermal decomposition temperature 19. SO_2 absorption liquid thermal decomposition products 20. SO_2 absorption liquid thermal decomposition rate	1. SO_2 absorption rate 2. SO_2 absorption efficiency 3. SO_2 absorption capacity 4. SO_2 absorption temperature 5. SO_2 absorption pressure 6. SO_2 absorption liquid flow rate 7. SO_2 absorption gas flow rate 8. SO_2 absorption gas composition 9. SO_2 absorption liquid composition 10. SO_2 absorption liquid pH 11. SO_2 absorption liquid viscosity 12. SO_2 absorption liquid surface tension 13. SO_2 absorption liquid density 14. SO_2 absorption liquid specific heat 15. SO_2 absorption liquid thermal conductivity 16. SO_2 absorption liquid thermal expansion coefficient 17. SO_2 absorption liquid thermal stability 18. SO_2 absorption liquid thermal decomposition temperature 19. SO_2 absorption liquid thermal decomposition products 20. SO_2 absorption liquid thermal decomposition rate

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-077

DATE 3-10-70

TIME OF DAY 1530

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE

INPUT, #/HR
OUTPUT, #/HR

279.0
298.1

5982.
5994.

PART.SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

3232.
3313.

5994.
4958.

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

1403.
1533.

4958.
5276.

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 6.90
COMBINED 6.90
FREE 0.0
MONO(TOTAL) 6.90
MONO(DISSOLVED) 0.96
MONO(SOLID) 5.94
BISULFITE 0.10
MGO 0.54
SULFATE *****
MAGNESIUM 7.44
FLYASH -----
SOLIDS, MG -----

GM SO2/
100ML

1.0779
1.0779
0.0
1.0779
0.1500
0.9279
0.0078
0.0848

1.1627

GRAM/
100ML

1.560
19.671
0.145
0.339

22.954

MAKEUP MGO COMPOSITION

SLURRY CONC. GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 9.00
SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.60
FLYASH CONC. GM/100ML = 0.60

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.504395
HYDROGEN 0.666516
OXYGEN 1.390033
NITROGEN 5.021603
SULFUR 0.009620

FEED RATE, #/SEC= 1.75

ENTHALPY, BTU/# = -831.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-078	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H20	0.1150E 02	N.G. FLOW,%SCALE	0.9900E 02
TIME	1615	BURNER DP,H20	0.5000E 01	N.G. STATIC,R.O.	0.8600E 01
PRI.AIR ST,HG	0.1600E 01	FURN. ST,H20	0.6200E 01	SCREW SPEED,RPM	0.4120E 03
PRI.AIR DP,H20	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.2000E 01
SEC.AIR ST,HG	0.1700E 01	PP EXIT DP,H20	0.5200E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2100E 01	FURN.EX.ST,H20	0.4500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2884E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR DRIF.	0.6500E 03	PART.SCRUB.IN	0.7000E 03
ABS NOZ.,PSIG	0.0	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1700E 03
ABS LOAD,PSIG	0.3800E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4000E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1010E 04	PRI.AIR FAN IN.	0.7600E 02
CARD NUMBER	7	NO.2 BANK OUT	0.9900E 03	PRI.AIR WGT BULB	0.5900E 02
MODE OF OPER.	2	FURN. EXIT	0.8800E 03	SEC.AIR FAN IN.	0.0
PART.SCR.ST,HG	0.3000E 00	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.0
PART.SCR.DP,H20	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H20	0.5800E 01	VENT.ABS.DP,H20	0.1400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H20	0.4800E 01	FBA SUMP DP,H20	0.0
#1 ORIF.DP,H20	0.4400E 01	CARD NUMBER	11	FBA DP,H20	0.0
		TEMP.THERMOMETERS,F		FBA DEMIST.DP,H20	0.0
CARD NUMBER	10	PART.CYC.EXIT	0.1460E 03	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1430E 03	ABS CYC.EXIT	0.1450E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.SUMP	0.1450E 03	PART.INIT.GAL	0.7210E 05
FBA INLET	0.0	ABS CYC.SUMP	0.1440E 03	PART.FINAL,GAL	0.7247E 05
FBA EXIT	0.0	FBA SUMP	0.0	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1400E 03	MGO SLAK TANK	0.0	ABS H20 IN.GAL	0.1433E 05
PART.CYC.SUMP	0.1400E 03	MGOH2 TANK	0.7400E 02	ABS H20 FI.GAL	0.1436E 05
ABS CYC.SUMP	0.1400E 03			ABS H20 TIME,MIN	0.6000E 02
FBA SUMP	0.0			MGO ROTO.SCALE,%	0.8000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.8000E 02
MGOH2 TANK	0.7200E 02				
MAKEUP WATER	0.8000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-078

DATE 3-10-70

TIME OF DAY 1615

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	17.50	-----	-----	35.00	236.5	5414.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	*****	-----	-----	*****	255.8	5423.	CARBON 0.503795
							HYDROGEN 0.557507
							OXYGEN 1.389981
PART. SCRUBBER							NITROGEN 5.022186
INPUT, #/HR	*****	-----	-----	*****	3276.	5423.	SULFUR 0.009589
OUTPUT, #/HR	*****	-----	-----	*****	3299.	4840.	

FEED RATE, #/SEC= 1.58

ENTHALPY, BTU/# = 717.

*

*SO2 ABSORBERS- PRODUCT COMP.

SO2 ABSORBERS	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
INPUT, #/HR	*****	*****	*****	SLURRY CONC.- GM MGO/100ML = *****
OUTPUT, #/HR	*****	0.0	*****	MGO PRESLAKED, NO=0, YES=1 0 *****
				% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	F-079	CARD NUMBER	2	CARD NUMBER	3
DATE	3-10-70	WINDBOX ST,H2O	0.1050E 02	N.G. FLOW,%SCALE	0.9900E 02
TIME	1715	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1500E 01	FURN. ST,H2O	0.5000E 01	SCREW SPEED,RPM	0.4200E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.2000E 01	D2 FURN.EX.%-BM	0.1900E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.2000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2885E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6450E 03	PART.SCRUB.IN	0.6400E 03
ABS NOZ.,PSIG	0.0	WINDBOX-TOP	0.6400E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4000E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.0	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	0	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE		NO.1 BANK OUT	0.7900E 03	PRI.AIR FAN IN.	0.7800E 02
		NO.2 BANK OUT	0.7500E 03	PRI.AIR WGT BULB	0.5600E 02
CARD NUMBER	7	FURN. EXIT	0.7200E 03	SEC.AIR FAN IN.	0.0
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.0
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.6000E 01	VENT.ABS.OP,H2O	0.1000E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.1000E 01	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1380E 03	TEMP.THERMOMETERS,F	0.1400E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1400E 03	PART.INIT.GAL	0.7247E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1400E 03	PART.FINAL,GAL	0.7280E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.1320E 03	ABS H2O IN.GAL	0.1436E 05
PART.CYC.SUMP	0.1360E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1438E 05
ABS CYC.SUMP	0.1360E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.7400E 02	MGO ROTO.SCALE,%	0.8100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.8100E 02
MGOH2 TANK	0.7000E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER F-079

DATE 3-10-70

TIME OF DAY 1715

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	503.	110.0	-----	-----	-----	-----	0.006	45.1	500.	20.3
SECONDARY AIR	4815.	642.5	-----	-----	-----	-----	0.001	6.3	4809.	10.5
FURNACE EXIT	5777.	720.0	*****	*****	*****	*****	0.047	109.8	5517.	2.0
PART.SCRB.INLET	5777.	640.0	*****	*****	*****	*****	0.047	109.8	-----	1.4
PART.CYC.EXIT	5630.	140.0	*****	*****	*****	*****	0.133	141.7	4968.	-13.5
VENT ABS.INLET	5630.	140.0	*****	*****	*****	*****	0.133	141.7	-----	-17.9
ABS CYC.EXIT	5931.	140.0	*****	*****	*****	*****	0.121	137.3	-----	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5931.	136.0	*****	*****	*****	*****	0.121	137.3	5290.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	5.61	60.0	3.5	*****
MAKEUP WATER	140.0	5.09	70.0	7.8	*****
PRODUCT LIQ.	140.0	23.15	132.0	14.6	*****
RECIRCULATED LIQ.			132.0	0.0	*****
			REC.(SPRAY NOZ)	0.0	*****
			REC.(FLOW NOZ.)	0.0	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.609E 07
% FUEL AS COAL	96.7
COAL FLOW RATE,#/HR	483.7
NAT.GAS FLOW,#/HR	9.0
% EXCESS AIR	9.0
OXYGEN,% DRY, MEAS.	1.90
CO2,% DRY-CALC.	16.44
HUMIDITY,#/# - CALC.	0.047

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	156.6
LIQ/GAS,GAL/MCF	14.9
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.4

PART.

VENT ABS.

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = 4.6

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= *****
 MOL% TOTAL SULF= *****
 O2 AT FURN.EX.= 1.90
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER F-079

DATE 3-10-70

TIME OF DAY 1715

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	17.90	-----	-----	35.80	240.7	5507.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	*****	-----	-----	*****	260.0	5517.	CARBON 0.506282
							HYDROGEN 0.537844
PART.SCRUBBER							OXYGEN 1.389710
INPUT, #/HR	*****	-----	-----	*****	3065.	5517.	NITROGEN 5.019892
OUTPUT, #/HR	*****	-----	-----	*****	3211.	4968.	SULFUR 0.009640

SO2 ABSORBERS

INPUT, #/HR	*****	*****	*****	*****	*****	*****	FEED RATE, #/SEC= 1.61
OUTPUT, #/HR	*****	*****	*****	*****	*****	*****	ENTHALPY, BTU/# = 958.

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	6.27	GM SO2/	GRAM/	MAKEUP MGO COMPOSITION	
COMBINED	6.27	100ML	100ML	SLURRY CONC.- GM MGO/100ML =	*****
FREE	0.0			MGO PRESLAKED, NO=0, YES=1	0
MONO(TOTAL)	6.27			% SLAKED TO MG(OH)2, MEAS. =	*****

MONO(DISSOLVED)	1.00			PRODUCT MG BASE PHYSICAL PROPERTIES	
MONO(SOLID)	5.27			ACID STRENGTH, PH =	*****
BISULFITE	0.0			SP.GRAVITY, HYDROM. =	1.0900
MGO	0.81				

SULFATE	*****			PARTICULATE SCRUBBER PRODUCT	
MAGNESIUM	7.08			ACID STRENGTH, PH =	*****
FLYASH	-----			FLYASH CONC. GM/100ML =	*****
SOLIDS, MG	-----				

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	G-080	CARD NUMBER	2	CARD NUMBER	3
DATE	3-18-70	WINDBOX ST,H20	0.5500E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1245	BURNER DP,H20	0.6000E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H20	0.2000E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H20	0.2400E 01	PP EXIT ST,HG	-0.2000E 01	D2 FURN.EX.%-BM	0.3100E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H20	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.1000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2909E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1000E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.1500E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6380E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.2800E 02	WINDBOX-WEST	0.6380E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6380E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6700E 03	PRI.AIR FAN IN.	0.8900E 02
		NO.2 BANK OUT	0.5700E 03	PRI.AIR WGT BULB	0.6600E 02
CARD NUMBER	7	FURN. EXIT	0.4750E 03	SEC.AIR FAN IN.	0.4000E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4000E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H20	0.5400E 01				
PART.CYC.DP,H20	0.5200E 01				
#1 ORIF.ST,HG	-0.1000E 01				
#1 ORIF.DP,H20	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H20	0.1200E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H20	0.5400E 01	FBA SUMP DP,H20	0.0
		FBA DP,H20	0.0
		FBA DEMIST.OP,H20	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1320E 03	TEMP.THERMOMETERS,F	0.1340E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1330E 03	PART.INIT.GAL	0.7495E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1310E 03	PART.FINAL,GAL	0.7529E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1300E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.0	ABS H20 IN.GAL	0.1500E 05
PART.CYC.SUMP	0.1250E 03	FBA SUMP	0.0	ABS H20 FI.GAL	0.1503E 05
ABS CYC.SUMP	0.1020E 03	MGO SLAK TANK	0.0	ABS H20 TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.7400E 02	MGO ROTO.SCALE,%	0.9200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.9200E 02
MGOH2 TANK	0.6800E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER G-080

DATE 3-18-70

TIME OF DAY 1245

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	502.	110.0	-----	-----	-----	-----	0.009	60.2	497.	16.3
SECONDARY AIR	4930.	646.5	-----	-----	-----	-----	0.006	47.1	4901.	5.5
FURNACE EXIT	5870.	475.0	*****	*****	*****	*****	0.049	111.1	5596.	1.0
PART.SCRB.INLET	5870.	150.0	*****	*****	*****	*****	0.049	111.1	-----	2.7
PART.CYC.EXIT	5715.	134.0	5445.4	*****	*****	*****	0.027	91.1	5564.	-13.5
VENT ABS.INLET	5715.	134.0	*****	*****	*****	*****	0.027	91.1	-----	-17.7
ABS CYC.EXIT	6184.	133.0	*****	*****	*****	*****	0.020	81.3	-----	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	6184.	125.0	2268.0	*****	*****	*****	0.020	81.3	6060.	-27.1

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	TEMP, F	FLOW, #/M	FBA TEMP, F	FLOW, #/M
PARTICULATE	60.0	5.57	60.0	4.3	*****	*****	
MAKEUP WATER	131.0	5.09	68.0	8.6	*****	*****	
PRODUCT LIQ.	131.0	23.15	PRODUCT LIQ.	12.8	*****	*****	
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	504.0	*****	*****	
			REC.(FLOW NOZ.)	436.3	*****	*****	

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.581E 07
% FUEL AS COAL	96.6
COAL FLOW RATE, #/HR	461.1
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	14.8
OXYGEN, % DRY, MEAS.	3.10
CO2, % DRY-CALC.	15.39
HUMIDITY, #/# - CALC.	0.049

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY, FPS	147.2
LIQ/GAS, GAL/MCF	15.8
LIQ/GAS, #/#	2.0
PRES.DROP, IN. WG	5.4

VENT ABS.

58.35

77.6
32.1
4.2
1.2

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA, #MOLE/HR-FT2,	=	63.8	KGA, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	7.24	SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME, MIN	=	10.3	SUMP RESID.TIME, MIN	=	*****

CONC., GM-MOLE/L=	0.6299
MOL% TOTAL SULF=	35.10
O2 AT FURN. EX.=	3.10
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	G-080	DATE	3-18-70	TIME OF DAY	1245
MATERIAL BALANCES					
FURNACE					
INPUT, #/HR	17.06	SULFUR	---	MAGNESIUM	---
OUTPUT, #/HR	*****		---	FLYASH	34.12
				WATER	254.8
				DRY GAS	5586.
					5596.
PART. SCRUBBER					
INPUT, #/HR	*****		---		
OUTPUT, #/HR	31.59		---		
					5596.
					5564.
SO2 ABSORBERS					
INPUT, #/HR	31.59		22.70		5564.
OUTPUT, #/HR	62.54		33.06		6060.
* *SO2 ABSORBERS-PRODUCT COMP.					
TOTAL,	8.53	GM SO2/100ML	---	GRAM/100ML	---
COMBINED	7.44		---		---
FREE	1.09		---		---
MONO(TOTAL)	6.34		---		---
MONO(DISSOLVED)	1.90		---		---
MONO(SOLID)	4.44		---		---
BISULFITE	2.48		---		---
MGO	0.0		---		---
SULFATE	4.03		---		---
MAGNESIUM	11.47		---		---
FLYASH	---		---		---
SOLIDS, MG	---		---		---
COAL COMPOSITION-MASS					
CARBON	0.7150				
HYDROGEN	0.0485				
OXY+NIT	0.0817				
SULFUR	0.0370				
ASH	0.0740				
WATER	0.0438				

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.477485
HYDROGEN 0.552470
OXYGEN 1.393096
NITROGEN 5.046398
SULFUR 0.009085

FEED RATE, #/SEC = 1.63

ENTHALPY, BTU/# = -525.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.30
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 5.20
SP. GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.40
FLYASH CONC. GM/100ML = 1.00

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	G-081	CARD NUMBER	2	CARD NUMBER	3
DATE	3-18-70	WINDBOX ST,H2O	0.5500E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1345	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.D.	0.8000E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.3750E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.2000E 01	O2 FURN.EX,%-BM	0.3000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX,ST,H2O	0.4000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2910E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1050E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.1500E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6400E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.2800E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF-INCH	0.4800E 01	WINDBOX-BOT.	0.6550E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6600E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.5750E 03	PRI.AIR FAN IN.	0.8800E 02
		NO.2 BANK OUT	0.4800E 03	PRI.AIR WGT BULB	0.6500E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.4000E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	0.4000E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.5200E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.4400E 01	VENT.ABS.DP,H2O	0.8000E 00	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.1000E 01	ABS CYC.DP,H2O	0.4400E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4200E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1320E 03	TEMP.THERMOMETERS,F	0.1370E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1320E 03	PART.INIT.GAL	0.7529E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1300E 03	PART.FINAL,GAL	0.7560E 05
FBA EXIT	0.1260E 03	PART.CYC.SUMP	0.1310E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1503E 05
PART.CYC.SUMP	0.1000E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1509E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.7600E 02	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO.SCALE,%	0.1000E 03
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER G-081

DATE 3-18-70 TIME OF DAY 1345

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	110.0	---	---	---	---	0.009	58.7	487.	16.3
SECONDARY AIR	4998.	648.8	---	---	---	---	0.006	46.9	4969.	5.5
FURNACE EXIT	5935.	480.0	*****	*****	*****	*****	0.049	111.4	5657.	4.0
PART.SCRB.INLET	5935.	150.0	*****	*****	*****	*****	0.049	111.4	---	2.7
PART.CYC.EXIT	5705.	137.0	*****	*****	*****	*****	0.026	89.4	5563.	-13.5
VENT ABS.INLET	5705.	137.0	*****	*****	*****	*****	0.026	89.4	---	-17.7
ABS CYC.EXIT	6199.	132.0	*****	*****	*****	*****	0.012	64.8	---	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT DRIF.	6199.	126.0	1860.8	*****	*****	*****	0.012	64.8	6128.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	5.22	---	60.0	8.7
MAKEUP WATER	130.0	5.09	MAKEUP MGD SL.	76.0	9.2
PRODUCT LIQ.	130.0	23.15	PRODUCT LIQ.	131.0	22.2
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	131.0	504.0
			REC.(FLOW NOZ.)		455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.590E 07
% FUEL AS COAL	96.7
COAL FLOW RATE,#/HR	468.8
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	14.3
OXYGEN,%DRY,MEAS.	3.00
CO2,%DRY-CALC.	15.48
HUMIDITY,#/# - CALC.	0.049

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	82.8
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	5.9

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	147.5
LIQ/GAS,GAL/MCF	15.8
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	5.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

VENT ABS.

67.52

77.1
33.7
4.4
0.8

FLOAT.BED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.5537
MOL% TOTAL SULF=	32.61
O2 AT FURN.EX.=	3.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER G-081

DATE 3-18-70

TIME OF DAY 1345

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE
INPUT, #/HR 17.35
OUTPUT, #/HR *****

PART. SCRUBBER
INPUT, #/HR *****
OUTPUT, #/HR 33.21

SO2 ABSORBERS
INPUT, #/HR 33.21
OUTPUT, #/HR 86.14

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 7.63
COMBINED 6.39
FREE 1.23
MONO(TOTAL) 5.16
MONO(DISSOLVED) *****
MONO(SOLID) *****
BISULFITE *****
MGO 0.0
SULFATE 3.54
MAGNESIUM 9.94
FLYASH -----
SOLIDS, MG -----

SULFUR 17.35
MAGNESIUM -----
FLYASH 34.69
WATER 258.6
DRY GAS 5647.
5657.
277.7
2888.
2692.
5657.
5563.
1180.
1313.
5563.
6128.

FEED RATE, #/SEC= 1.65
ENTHALPY, BTU/# = -465.

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 7.30
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.50
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.40
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	G-082	CARD NUMBER	3
DATE	3-18-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	1445	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1200E 01	SCREW SPEED, RPM	0.3900E 03
PRI. AIR DP, H2O	0.2300E 01	02 FURN. EX. % - BM	0.2800E 01
SEC. AIR ST, HG	0.1400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2808E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1050E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.1500E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6380E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.2800E 02	WINDBOX-WEST	0.6380E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4500E 01	WINDBOX-BOT.	0.6500E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6600E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.5800E 03	PRI. AIR FAN IN.	0.8800E 02
		NO.2 BANK OUT	0.4800E 03	PRI. AIR WGT BULB	0.6500E 02
		FURN. EXIT	0.1100E 03	SEC. AIR FAN IN.	0.4000E 02
		COAL-AIR		SEC. AIR WET BULB	0.4000E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	2	TEMP. THERMOMETERS, F	0.1300E 03	FBA INLET ST, HG	0.0
PART. SCR. ST, HG	0.2000E 00	PART. CYC. EXIT	0.1320E 03	FBA SUMP DP, H2O	0.0
PART. SCR. DP, H2O	0.5200E 01	ABS CYC. EXIT	0.1300E 03	FBA DP, H2O	0.0
PART. CYC. DP, H2O	0.4200E 01	PART. CYC. SUMP	0.1310E 03	FBA DEMIST. DP, H2O	0.0
#1 ORIF. ST, HG	-0.1000E 01	ABS CYC. SUMP	0.0		
#1 ORIF. DP, H2O	0.4200E 01	FBA SUMP	0.0		
		MGO SLAK TANK	0.8000E 02		
		MGOH2 TANK			

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1320E 03	TEMP. THERMOMETERS, F	0.1300E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1320E 03	PART. INIT. GAL	0.7560E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1300E 03	PART. FINAL, GAL	0.7591E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1310E 03	PART. TIME, MIN	0.6000E 02
P.P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1509E 05
PART. CYC. SUMP	0.1250E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1514E 05
ABS CYC. SUMP	0.1000E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.8000E 02	MGO ROTO. SCALE, %	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER G-082

DATE 3-18-70

TIME OF DAY 1445

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/%	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	483.	110.0	---	---	---	---	0.009	59.2	478.	16.3
SECONDARY AIR	4913.	646.5	---	---	---	---	0.006	46.9	4884.	5.2
FURNACE EXIT	5839.	480.0	*****	*****	*****	*****	0.050	110.4	5562.	1.0
PART-SCRUB-INLET	5839.	150.0	*****	*****	*****	*****	0.050	110.4	---	2.7
PART-CYC.EXIT	5633.	130.0	*****	*****	*****	*****	0.027	90.2	5483.	-13.5
VENT ABS-INLET	5633.	130.0	*****	*****	*****	*****	0.027	90.2	---	-17.7
ABS CYC.EXIT	6080.	132.0	*****	*****	*****	*****	0.018	76.9	---	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6080.	124.0	1927.1	*****	*****	*****	0.018	76.9	5970.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M
PARTICULATE			MAKEUP WATER		60.0	5.9
MAKEUP WATER	60.0	5.22	MAKEUP MGO SL.		78.0	9.2
PRODUCT LIQ.	130.0	5.09	PRODUCT LIQ.		131.0	15.7
RECIRCULATED LIQ.	130.0	23.15	REC.(SPRAY NOZ)		131.0	504.0
			REC.(FLOW NOZ.)			441.2

FURNACE PERFORMANCE

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M
HEAT RELEASE,BTU/HR	0.586E 07		MAKEUP WATER		60.0	5.9
% FUEL AS COAL	96.7		MAKEUP MGO SL.		78.0	9.2
COAL FLOW RATE,#/HR	465.9		PRODUCT LIQ.		131.0	15.7
NAT.GAS FLOW,#/HR	8.7		REC.(SPRAY NOZ)		131.0	504.0
% EXCESS AIR	13.3		REC.(FLOW NOZ.)			441.2
OXYGEN,% DRY, MEAS.	2.80					
CO2,% DRY-CALC.	15.66					
HUMIDITY,#/# - CALC.	0.050					

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 80.6

SULFITE/SO2-MOL/MOL = 7.11

SUMP RESID.TIME,MIN = 8.4

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.3126

MOL% TOTAL SULF= 33.58

O2 AT FURN.EX.= 2.80

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER G-082

DATE 3-18-70

TIME OF DAY 1445

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	17.24	-----	34.48	257.9	5552.	
OUTPUT, #/HR	*****	-----	*****	276.7	5562.	
PART. SCRUBBER						
INPUT, #/HR	*****	-----	*****	2890.	5562.	
OUTPUT, #/HR	33.88	-----	*****	2699.	5483.	
SO2 ABSORBERS						
INPUT, #/HR	33.88	23.26	*****	1017.	5483.	
OUTPUT, #/HR	42.14	19.46	*****	948.	5970.	

* SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE	4.41	0.6897	-----
	3.51	0.5484	-----
	0.90	0.1413	-----
MONO (TOTAL)	2.61	0.4071	-----
MONO (DISSOLVED)	1.98	0.3094	-----
MONO (SOLID)	0.63	0.0977	3.217
BISULFITE	1.92	0.1500	2.072
MGO	0.0	0.0	2.790
SULFATE	2.00	0.3126	0.0
MAGNESIUM	5.51	0.8611	3.752
FLYASH	-----	-----	-----
SOLIDS, MG	-----	-----	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.484816
HYDROGEN	0.558636
OXYGEN	1.392253
NITROGEN	5.039645
SULFUR	0.009230

FEED RATE, #/SEC = 1.62

ENTHALPY, BTU/# = -756.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.00

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 5.50

SP. GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	G-083	CARD NUMBER	2	CARD NUMBER	3
DATE	3-18-70	WINDBOX ST,H2O	0.5400E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1610	BURNER DP,H2O	0.6200E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.1000E 01	SCREW SPEED,RPM	0.4000E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.2000E 01	O2 FURN.EX.%-BM	0.2900E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.5000E 00	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2809E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1050E 03	PART.SCRUB.IN	0.1500E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.2800E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6750E 03	PRI.AIR FAN IN.	0.8900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5850E 03	PRI.AIR WGT BULB	0.6700E 02
MODE OF OPER.	2	FURN. EXIT	0.4900E 03	SEC.AIR FAN IN.	0.4000E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4000E 02
PART.SCR.DP,H2O	0.4600E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5400E 01	VENT.ABS.DP,H2O	0.1200E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.1000E 01	ABS CYC.DP,H2O	0.5200E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1320E 03	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.7591E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1320E 03	PART.FINAL,GAL	0.7605E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1310E 03	PART.TIME,MIN	0.2500E 02
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.1300E 03	ABS H2O IN.GAL	0.1514E 05
PART.CYC.SUMP	0.1260E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1514E 05
ABS CYC.SUMP	0.1000E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.2500E 02
FBA SUMP	0.0	MGOH2 TANK	0.8200E 02	MGO ROTO.SCALE,%	0.1000E 03
MGO SLAK TANK	0.0			MAKEUP SETTING	0.1000E 03
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER G-083

DATE 3-18-70

TIME OF DAY 1610

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	493.	110.0	-----	-----	-----	-----	0.011	62.6	488.	16.3
SECONDARY AIR	4811.	647.5	-----	-----	-----	-----	0.006	46.9	4782.	5.4
FURNACE EXIT	5736.	490.0	5933.0	-----	-----	-----	0.050	110.3	5465.	0.5
PART.SCRB.INLET	5736.	150.0	-----	-----	-----	-----	0.050	110.3	-----	2.7
PART.CYC.EXIT	5733.	137.0	5978.9	-----	-----	-----	0.026	89.0	5587.	-13.5
VENT ABS.INLET	5733.	137.0	-----	-----	-----	-----	0.026	89.0	-----	-17.9
ABS CYC.EXIT	6078.	132.0	-----	-----	-----	-----	0.014	69.6	-----	-27.1
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	6078.	126.0	2108.5	-----	-----	-----	0.014	69.6	5992.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M	FBA
PARTICULATE	60.0	5.50	MAKEUP WATER	TEMP,F	60.0	1.3	TEMP,F
MAKEUP WATER	131.0	5.09	MAKEUP MGO SL.	FLOW,#/M	78.0	9.2	FLOW,#/M
PRODUCT LIQ.	131.0	23.15	PRODUCT LIQ.	TEMP,F	130.0	17.5	TEMP,F
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ.)	FLOW,#/M	130.0	504.0	FLOW,#/M
-----	-----	-----	REC.(FLOW NOZ.)	TEMP,F	-----	455.7	TEMP,F

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M	FBA
HEAT RELEASE,BTU/HR	0.573E 07	96.6	5.50	MAKEUP WATER	TEMP,F	60.0	1.3	TEMP,F
FUEL AS COAL	455.1	8.7	5.09	MAKEUP MGO SL.	FLOW,#/M	78.0	9.2	FLOW,#/M
COAL FLOW RATE,#/HR	13.8	2.90	23.15	PRODUCT LIQ.	TEMP,F	130.0	17.5	TEMP,F
NAT.GAS FLOW,#/HR	15.57	0.050	-----	REC.(SPRAY NOZ.)	FLOW,#/M	130.0	504.0	FLOW,#/M
EXCESS AIR	-----	-----	-----	REC.(FLOW NOZ.)	TEMP,F	-----	455.7	TEMP,F
OXYGEN,3DRY,MEAS.	-----	-----	-----	-----	FLOW,#/M	-----	-----	FLOW,#/M
CO2,3DRY-CALC.	-----	-----	-----	-----	TEMP,F	-----	-----	TEMP,F
HUMIDITY,#/# - CALC.	-----	-----	-----	-----	FLOW,#/M	-----	-----	FLOW,#/M

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 75.0
SULFITE/SO2-MOL/MOL = 6.67
SUMP RESID.TIME,MIN = 7.5

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 =
SULFITE/SO2-MOL/MOL =
SUMP RESID.TIME,MIN =

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.6276
MOL% TOTAL SULF= 39.09
O2 AT FURN.EX.= 2.90
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER G-083

DATE 3-18-70

TIME OF DAY 1610

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	16.84	---	---	33.68	252.8	5456.
OUTPUT, #/HR	33.78	---	---	*****	271.6	5465.
PART. SCRUBBER						
INPUT, #/HR	33.78	---	---	*****	3024.	5465.
OUTPUT, #/HR	34.80	---	---	*****	2696.	5587.

FEED RATE, #/SEC= 1.59

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

34.80	23.59	*****	737.	5587.
70.61	39.96	*****	932.	5992.

ENTHALPY, BTU/# = -784.

* SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 7.10
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,	6.91	1.0802	---	---
COMBINED	6.11	0.9539	---	---
FREE	0.81	0.1263	---	---
MONO(TOTAL)	5.30	0.8276	---	---
MONO(DISSOLVED)	1.82	0.2844	2.957	---
MONO(SOLID)	3.48	0.5432	11.517	---
BISULFITE	2.16	0.1687	3.139	---
MGO	0.0	0.0	0.0	---
SULFATE	4.02	0.6276	7.531	---
MAGNESIUM	10.12	1.5815	---	---
FLYASH	---	---	*****	---
SOLIDS, MG	---	---	10.973	---

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-084	CARD NUMBER	2	CARD NUMBER	3
DATE	3-23-70	WINDBOX ST,H2O	0.6200E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1000	BURNER DP,H2O	0.6400E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.8000E 00	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-2000E 01	02 FURN.EX,%-BM	0.5900E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX,ST,H2O	0.2000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2858E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1000E 03	PART.SCRUB.IN	0.4400E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6650E 03	#1 ORIFICE	0.1300E 03
ABS LOAD,PSIG	0.2800E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4500E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6850E 03	PRI.AIR FAN IN.	0.7300E 02
		NO.2 BANK OUT	0.5900E 03	PRI.AIR WGT BULB	0.5600E 02
		FURN. EXIT	0.4950E 03	SEC.AIR FAN IN.	0.3600E 02
		COAL-AIR	0.1000E 03	SEC.AIR WET BULB	0.3200E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	2	CARD NUMBER		FBA INLET ST,HG	0.0
PART.SCR.ST,HG	0.1500E 00	VENT.ABS.DP,H2O	0.1600E 01	FBA SUMP DP,H2O	0.0
PART.SCR.DP,H2O	0.5500E 01	ABS CYC.DP,H2O	0.5200E 01	FBA DP,H2O	0.0
PART.CYC.DP,H2O	0.5400E 01			FBA DEMIST.DP,H2O	0.0
#1 ORIF.ST,HG	-0.1000E 01				
#1 ORIF.DP,H2O	0.4200E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1280E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.7744E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1280E 03	PART.FINAL,GAL	0.7774E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1280E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1220E 03	ABS CYC.SUMP	0.1240E 03	ABS H2O IN.GAL	0.1554E 05
PART.CYC.SUMP	0.1220E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1560E 05
ABS CYC.SUMP	0.8000E 02	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.8100E 02	MGO ROTU.SCALE,%	0.7300E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.7300E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER H-084

DATE 3-23-70

TIME OF DAY 1000

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	492.	100.0	---	---	---	---	0.007	50.1	488.	16.3
SECONDARY AIR	4876.	648.8	---	---	---	---	0.004	33.4	4858.	6.2
FURNACE EXIT	5734.	495.0	5163.5	---	892.	---	0.041	104.3	5510.	2.0
PART.SCRB.INLET	5734.	440.0	-----	-----	-----	-----	0.041	104.3	-----	2.0
PART.CYC.EXIT	5543.	134.0	-----	-----	-----	-----	0.083	126.0	5116.	-13.5
VENT ABS.INLET	5543.	134.0	-----	-----	-----	-----	0.083	126.0	-----	-17.7
ABS CYC.EXIT	6010.	128.0	-----	-----	-----	-----	0.076	121.6	-----	-27.1
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	6010.	122.0	1100.7	-----	867.	-----	0.076	121.6	5586.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.02	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	128.0	5.09	MAKEUP MGD SL.	60.0 8.3	-----
PRODUCT LIQ.	128.0	23.15	PRODUCT LIQ.	80.0 7.2	-----
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	124.0 16.2	-----
			REC.(FLOW NOZ.)	124.0 504.0	-----
				441.2	-----

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.487E 07
% FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	384.3
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	28.1
OXYGEN,% DRY, MEAS.	5.90
CO2,% DRY-CALC.	12.95
HUMIDITY,#/# - CALC.	0.041

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	2.82
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	151.8
LIQ/GAS,GAL/MCF	15.4
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.5

VENT ABS.

78.07

79.5
31.7
4.4
1.6

VENT ABS.

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 102.9
 SULFITE/SO2-MOL/MOL = 5.12
 SUMP RESID.TIME,MIN = 8.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2
 SULFITE/SO2-MOL/MOL
 SUMP RESID.TIME,MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0340
 MOL% TOTAL SULF= 4.26
 O2 AT FURN.EX.= 5.90
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-084 DATE 3-23-70 TIME OF DAY 1000 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.22	---	28.44	205.2	5504.
OUTPUT, #/HR	29.95	---	*****	224.2	5510.
PART. SCRUBBER					
INPUT, #/HR	29.95	---	*****	2735.	5510.
OUTPUT, #/HR	27.02	---	*****	2976.	5116.
SO2 ABSORBERS					
INPUT, #/HR	27.02	21.35	*****	1324.	5116.
OUTPUT, #/HR	33.16	19.97	*****	1295.	5586.

FEED RATE, #/SEC = 1.59 ENTHALPY, BTU/# = 2389.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
COMBINED	5.28	0.8249	---
FREE	5.26	0.8215	---
MONO(TOTAL)	0.02	0.0034	---
MONO(DISSOLVED)	5.24	0.8182	---
MONO(SOLID)	1.14	0.1781	1.852
BISULFITE	4.10	0.6400	13.569
MGO	0.80	0.0625	1.163
SULFATE	0.0	0.0	0.0
MAGNESIUM	0.22	0.0340	0.408
FLYASH	5.48	0.8555	---
SOLIDS, MG	---	---	*****

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 8.20

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 5.80

SP.GRAVITY, HYDROM. = 1.0520

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-085	CARD NUMBER	2	CARD NUMBER	3
DATE	3-23-70	WINDBOX ST,H2O	0.6500E 01	N.G. FLOW,SCALE	0.9800E 02
TIME	1130	BURNER DP,H2O	0.6500E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.3300E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.2000E 01	02 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.1000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2859E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1050E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR DRIF.	0.6600E 03	PART.SCRUB.IN	0.4500E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6400E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.3050E 02	WINDBOX-WEST	0.6400E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4500E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6550E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7000E 03	PRI.AIR FAN IN.	0.7800E 02
		NO.2 BANK OUT	0.6000E 03	PRI.AIR WGT BULB	0.6000E 02
CARD NUMBER	7	FURN. EXIT	0.5050E 03	SEC.AIR FAN IN.	0.3700E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.5600E 01				
PART.CYC.DP,H2O	0.5400E 01				
#1 ORIF.ST,HG	-0.1000E 01				
#1 ORIF.DP,H2O	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1600E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.5200E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1280E 03	TEMP.THERMOMETERS,F	0.1315E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1280E 03	PART.INIT.GAL	0.7774E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1290E 03	PART.FINAL,GAL	0.7820E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1280E 03	PART.TIME,MIN	0.9000E 02
P.P.EXIT	0.1230E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1560E 05
PART.CYC.SUMP	0.1230E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1568E 05
ABS CYC.SUMP	0.8200E 02	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.9000E 02
FBA SUMP	0.0	MGOH2 TANK	0.8400E 02	MGO ROJO.SCALE,%	0.7200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.7200E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER H-085

DATE 3-23-70 TIME OF DAY 1130

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	477.	110.0	---	---	---	---	0.008	55.1	473.	16.3
SECONDARY AIR	4847.	648.8	---	---	---	---	0.003	31.8	4831.	6.5
FURNACE EXIT	5690.	505.0	4299.2	---	---	---	0.041	104.4	5466.	1.0
PART.SCRB.INLET	5690.	450.0	---	---	---	---	0.041	104.4	---	1.4
PART.CYC.EXIT	5553.	131.5	4120.1	---	---	---	0.086	126.9	5114.	-13.5
VENT ABS.INLET	5553.	131.5	---	---	---	---	0.086	126.9	---	-17.7
ABS CYC.EXIT	6005.	128.0	---	---	---	---	0.077	122.1	---	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	6005.	123.0	1033.8	*****	*****	*****	0.077	122.1	5576.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.01	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	129.0	5.09	MAKEUP MGO SL.	7.4	*****
PRODUCT LIQ.	129.0	23.15	PRODUCT LIQ.	7.2	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	15.7	*****
			REC.(FLOW NOZ.)	504.0	*****
				441.2	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.486E 07
% FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	383.6
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	27.6
OXYGEN,% DRY, MEAS.	5.80
CO2,% DRY-CALC.	13.04
HUMIDITY,#/# - CALC.	0.041

FLOAT.BED

VENT ABS.	FLOAT.BED
74.01	*****
*****	*****
*****	*****
*****	*****
*****	*****
79.5	*****
31.7	*****
4.4	*****
1.6	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	93.6
SULFITE/SO2-MOL/MOL	=	5.15
SUMP RESID.TIME,MIN	=	8.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0662
MOL% TOTAL SULF=	8.26
O2 AT FURN.EX.=	5.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-085

DATE 3-23-70

TIME OF DAY 1130

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.19	---	---	28.39	204.3	5460.
OUTPUT, #/HR	24.73	---	---	*****	223.3	5466.

PART. SCRUBBER	
INPUT, #/HR	24.73
OUTPUT, #/HR	22.17

SO2 ABSORBERS	
INPUT, #/HR	22.17
OUTPUT, #/HR	30.81

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	4.84
COMBINED	3.96
FREE	0.88
MONO(TOTAL)	3.08
MONO(DISSOLVED)	0.94
MONO(SOLID)	2.14
BISULFITE	2.20
MGO	0.0
SULFATE	0.42
MAGNESIUM	4.38
FLYASH	---
SOLIDS, MG	---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.410832
 HYDROGEN 0.479738
 OXYGEN 1.400859
 NITROGEN 5.107772
 SULFUR 0.007788

FEED RATE, #/SEC= 1.58

ENTHALPY, BTU/# = 2414.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****
 MGO PRESLAKED, NO=0, YES=1 0
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 5.80
 SP.GRAVITY, HYDROM. = 1.0500

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-086	CARD NUMBER	2	CARD NUMBER	3
DATE	3-23-70	WINDBOX ST,H20	0.6000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1300	BURNER DP,H20	0.6000E 01	N.G. STATIC,R.O.	0.7800E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H20	0.3000E 01	SCREW SPEED,RPM	0.3300E 03
PRI.AIR DP,H20	0.2300E 01	PP EXIT ST,HG	-0.2000E 01	O2 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H20	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2400E 01	FURN.EX.ST,H20	0.2000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1000E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6600E 03	PART.SCRUB.IN	0.4600E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4100E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7200E 03	PRI.AIR FAN IN.	0.8300E 02
CARD NUMBER	7	NO.2 BANK OUT	0.6300E 03	PRI.AIR WGT BULB	0.6500E 02
MODE OF OPER.	2	FURN. EXIT	0.5250E 03	SEC.AIR FAN IN.	0.3600E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.DP,H20	0.5500E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H20	0.5400E 01	VENT.ABS.DP,H20	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.1000E 01	ABS CYC.DP,H20	0.4900E 01	FBA SUMP DP,H20	0.0
#1 ORIF.DP,H20	0.4300E 01	CARD NUMBER	11	FBA DP,H20	0.0
CARD NUMBER	10	TEMP.THERMOMETERS,F	0.1320E 03	FBA DEMIST.DP,H20	0.0
TEMP.PILOT RECORDER,F	0.1290E 03	PART.CYC.EXIT	0.1280E 03	CARD NUMBER	12
#1 ORIFICE	0.0	ABS CYC.EXIT	0.1310E 03	MAKEUP FLOWS	
FBA INLET	0.0	ABS CYC.SUMP	0.1245E 03	PART.INIT.GAL	0.7820E 05
FBA EXIT	0.1230E 03	FBA SUMP	0.0	PART.FINAL,GAL	0.7865E 05
P.P.EXIT	0.1240E 03	MGO SLAK TANK	0.0	PART.TIME,MIN	0.9000E 02
PART.CYC.SUMP	0.9300E 02	MGOH2 TANK	0.7200E 02	ABS H2O IN.GAL	0.1568E 05
ABS CYC.SUMP	0.0			ABS H2O FI.GAL	0.1577E 05
FBA SUMP	0.0			ABS H2O TIME,MIN	0.9000E 02
MGO SLAK TANK	0.0			MGO ROTO.SCALE,%	0.7000E 02
MGOH2 TANK	0.7000E 02			MAKEUP SETTING	0.7000E 02
MAKEUP WATER	0.6000E 02				

FLUE GAS DATA

UNIT GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	490.	110.0	---	---	---	---	0.010	61.8	485.	16.3
SECONDARY AIR	5011.	642.5	---	---	---	---	0.004	33.3	4994.	6.0
FURNACE EXIT	5880.	525.0	4606.3	22.7	*****	*****	0.041	105.1	5647.	2.0
PART. SCRB. INLET	5880.	460.0	*****	*****	*****	*****	0.041	105.1	---	2.7
PART. CYC. EXIT	5648.	132.0	4529.3	*****	*****	*****	0.089	128.4	5188.	-13.5
VENT ABS. INLET	5648.	132.0	*****	*****	*****	*****	0.089	128.4	---	-17.8
ABS CYC. EXIT	6043.	128.0	*****	*****	*****	*****	0.079	123.2	---	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6043.	123.0	986.5	*****	*****	*****	0.079	123.2	5603.	-27.1

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FBA		
PARTICULATE	TEMP, F	FLOW, GPM	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
MAKEUP WATER	60.0	5.10	60.0	8.0	60.0	8.0
PRODUCT LIQ.	131.0	5.09	70.0	7.0	70.0	7.0
RECIRCULATED LIQ.	131.0	23.15	124.5	16.9	124.5	16.9
			124.5	504.0	124.5	504.0
				421.2		421.2

FURNACE PERFORMANCE

BURNANCE PERFORMANCE
 HEAT RELEASE, BTU/HR
 % FUEL AS COAL
 COAL FLOW RATE, #/HR
 NAT. GAS FLOW, #/HR
 % EXCESS AIR
 OXYGEN, % DRY, MEAS.
 CO₂, % DRY-CALC.
 HUMIDITY, #/# - CALC.

SCRUBBER PERFORMANCE

SCRUBBER PERFORMANCE		PART.
0.502E 07	S02 ABSORB.EFF	1.67
96.1	FLYASH COL.EFF	*****
396.7	S03 ABSORB.EFF	*****
8.9	NOX ABSORB.EFF	*****
27.6	GAS VELOCITY,FPS	152.5
5.80	LIQ/GAS,GAL/MCF	15.3
13.04	LIQ/GAS,#/#	2.1
0.041	PRES.DROP,IN.WG	5.5

PART.	VENT	AB.	FLGAT.
1.67	78.22		
*****	*****	*****	*****
*****	*****	*****	*****
*****	*****	*****	*****
*****	*****	*****	*****
152.5	79.0	*****	*****
15.3	30.5	*****	*****
2.1	4.2	*****	*****
5.5	1.7	*****	*****

SQ2 ABSORPTION PARAMETERS

VENTURI ABSORBER

```

KGA,#MOLE/HR-FT?,      = 103.6
SULFITE/SO2-MOL/MOL     = *****
SUMP RESID.TIME,MIN     = 7.8

```

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KG, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

```

CONC.,GM-MOLE/L=
MOL% TOTAL SULF=
02 AT FURN. EX.= 5.80
02 AT ABSORB.IN=
02 AT ABSORB.EX=

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MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-086

DATE 3-23-70

TIME OF DAY 1300

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	14.68	-----	29.36	213.0	5641.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	27.38	-----	*****	232.1	5647.	CARBON 0.410986
PART. SCRUBBER						HYDROGEN 0.500236
INPUT, #/HR	27.38	-----	*****	2784.	5647.	OXYGEN 1.400872
OUTPUT, #/HR	24.73	-----	*****	3009.	5188.	NITROGEN 5.107621
						SULFUR 0.007796

S02 ABSORBERS

INPUT, #/HR	24.73	*****	*****	1358.	5188.	FEED RATE, #/SEC= 1.63
OUTPUT, #/HR	31.51	18.84	*****	1456.	5603.	ENTHALPY, BTU/# = 2115.

*S02 ABSORBERS-PRODUCT COMP.

TOTAL,	GM S02/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION
COMBINED	5.06	0.7906	-----	SLURRY CONC.- GM MGO/100ML = *****
FREE	4.94	0.7719	-----	MGO PRESLAKED, NO=0, YES=1 *****
MONO(TOTAL)	0.12	0.0187	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	4.82	0.7531	-----	
MONO(SOLID)	*****	*****	*****	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	*****	*****	*****	ACID STRENGTH, PH = *****
MGO	0.0	0.0	0.0	SP.GRAVITY, HYDROM. = *****
SULFATE	*****	*****	*****	
MAGNESIUM	4.94	0.7719	-----	PARTICULATE SCRUBBER PRODUCT
FLYASH	-----	-----	-----	ACID STRENGTH, PH = *****
SOLIDS, MG	-----	-----	*****	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-087	CARD NUMBER	2	CARD NUMBER	3
DATE	3-23-70	WINDBOX ST,H2O	0.6000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1700	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.1800E 01	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.2000E 01	O2 FURN.EX.%-BM	0.6000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5200E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2863E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1000E 03	TEMP.CONTINUED	0.4800E 03
PART.LOAD,PSIG	0.4250E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.1400E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.0
ABS LOAD,PSIG	0.3500E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.7000E 03
ABS ORIF.INCH	0.4600E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7700E 03	AIR HEATER #2	0.8000E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.6500E 03	PRI.AIR FAN IN.	0.5900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5400E 03	PRI.AIR WGT BULB	0.3800E 02
MODE OF OPER.	2	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.3200E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR		SEC.AIR WET BULB	
PART.SCR.DP,H2O	0.5700E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5400E 01	VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.9000E 00	ABS CYC.DP,H2O	0.5200E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4200E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1300E 03	TEMP.THERMOMETERS,F	0.1330E 03	MAKEUP FLOWS	0.7962E 05
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1300E 03	PART.INIT.GAL	0.8003E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1300E 03	PART.FINAL,GAL	0.8730E 02
FBA EXIT	0.0	PART.CYC.SUMP	0.1280E 03	PART.TIME,MIN	0.1595E 05
P.P.EXIT	0.1240E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1606E 05
PART.CYC.SUMP	0.1250E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.8730E 02
ABS CYC.SUMP	0.8000E 02	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.7300E 02
FBA SUMP	0.0	MGOH2 TANK	0.7800E 02	MGO ROTO.SCALE,%	0.7300E 02
MGO SLAK TANK	0.8100E 02			MAKEUP SETTING	0.7300E 02
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER H-087

DATE 3-23-70

TIME OF DAY 1700

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	477.	110.0	---	---	---	---	0.007	51.3	474.	16.3
SECONDARY AIR	4880.	640.0	---	---	---	---	0.003	30.2	4865.	6.0
FURNACE EXIT	5721.	540.0	4944.8	####	####	####	0.040	103.9	5500.	2.0
PART.SCRB.INLET	5721.	480.0	####	####	####	####	0.040	103.9	---	1.4
PART.CYC.EXIT	5551.	133.0	4916.5	####	####	####	0.090	128.6	5092.	-12.2
VENT ABS.INLET	5551.	133.0	####	####	####	####	0.090	128.6	---	-16.4
ABS CYC.EXIT	6119.	130.0	####	####	####	####	0.079	122.8	---	-27.1
FLOATING BED IN	####	####	####	####	####	####	####	####	---	####
FLOATING BED EX	####	####	####	####	####	####	####	####	---	####
P.P. EXIT ORIF.	6119.	124.0	990.2	####	####	####	0.079	122.8	5672.	-27.1

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-087

DATE 3-23-70

TIME OF DAY 1700

INPUT FOR EQ. - KIN. PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FLOWS, #ATOMS/100#FEED
INPUT, #/HR	14.10	---	28.20	201.7	5494.	CARBON 0.405848
OUTPUT, #/HR	28.64	---	*****	220.7	5500.	HYDROGEN 0.464511
						OXYGEN 1.401446
						NITROGEN 5.112363
						SULFUR 0.007692

PART. SCRUBBER	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	28.64	---	*****	2617.	5500.
OUTPUT, #/HR	26.37	---	*****	3008.	5092.

SO2 ABSORBERS	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	WATER	DRY GAS
INPUT, #/HR	26.37	*****	*****	1564.	5092.
OUTPUT, #/HR	45.47	31.10	*****	1593.	5672.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	6.72	1.0500	---
COMBINED	6.72	1.0500	---
FREE	0.0	0.0	---
MONO(TOTAL)	6.72	1.0500	---
MONO(DISSOLVED)	*****	*****	*****
MONO(SOLID)	*****	*****	*****
BISULFITE	*****	*****	*****
MGO	0.32	0.0500	0.200
SULFATE	0.15	0.0235	0.282
MAGNESIUM	7.19	1.1235	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 2487.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	*****
MGO PRESLAKED, NO=0, YES=1	0
% SLAKED TO MG(OH)2, MEAS. =	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	*****
SP.GRAVITY, HYDROM. =	*****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	*****
FLYASH CONC. GM/100ML =	*****

* *TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-088	CARD NUMBER	3
DATE	3-23-70	N.G. FLOW,%SCALE	0.9700E 02
TIME	1935	N.G. STATIC,R.O.	0.7900E 01
PRI.AIR ST, HG	0.1300E 01	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2300E 01	02 FURN.EX.%-BM	0.6200E 01
SEC.AIR ST, HG	0.1300E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2350E 01	ELE.CHEM.MILVOLT	0.0
		CELL TEMP,F	0.0
		BAROMETRIC,HG	0.2863E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.9500E 02	PART.SCRUB.IN	0.4850E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.3450E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4500E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7100E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6420E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7850E 03	PRI.AIR FAN IN.	0.8300E 02
		NO.2 BANK OUT	0.6650E 03	PRI.AIR WGT BULB	0.6200E 02
CARD NUMBER	7	FURN. EXIT	0.5600E 03	SEC.AIR FAN IN.	0.3600E 02
MODE OF OPER.	2	COAL-AIR	0.1150E 03	SEC.AIR WET BULB	0.3600E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.5800E 01				
PART.CYC.DP,H2O	0.5500E 01				
#1 ORIF.ST,HG	-0.8000E 00				
#1 ORIF.DP,H2O	0.4400E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1300E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1350E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.8004E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1320E 03	PART.FINAL,GAL	0.8035E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1310E 03	PART.TIME,MIN	0.6052E 02
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.1320E 03	ABS H2O IN.GAL	0.1607E 05
PART.CYC.SUMP	0.1260E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1609E 05
ABS CYC.SUMP	0.1270E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6052E 02
FBA SUMP	0.0	MGOH2 TANK	0.8200E 02	MGO ROTO.SCALE,%	0.6400E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.6400E 02
MGOH2 TANK	0.8100E 02				
MAKEUP WATER	0.5600E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-088

DATE 3-23-70

TIME OF DAY 1935

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	486.	115.0	---	---	---	---	0.008	55.8	482.	17.6
SECONDARY AIR	4944.	635.5	---	---	---	---	0.005	42.8	4919.	7.4
FURNACE EXIT	5794.	560.0	4477.7	26.6	*****	*****	0.041	105.0	5563.	2.0
PART-SCRB.INLET	5794.	485.0	*****	*****	*****	*****	0.041	105.0	---	1.4
PART-CYC.EXIT	5682.	134.0	3944.3	*****	*****	*****	0.093	129.6	5200.	-10.8
VENT ABS.INLET	5682.	134.0	*****	*****	*****	*****	0.093	129.6	---	-15.2
ABS CYC.EXIT	6002.	132.0	*****	*****	*****	*****	0.077	122.3	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	6002.	126.0	930.4	*****	*****	*****	0.077	122.3	5572.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	56.0	5.16	---	3.9	*****
MAKEUP WATER	131.0	5.09	MAKEUP MGO SL.	6.6	*****
PRODUCT LIQ.	131.0	23.15	PRODUCT LIQ.	18.1	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	504.0	*****
			REC.(FLOW NOZ.)	441.2	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.483E 07
% FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	380.6
NAT.GAS FLOW,#/HR	8.7
% EXCESS AIR	29.5
OXYGEN,% DRY, MEAS.	6.20
CO2,% DRY-CALC.	12.69
HUMIDITY,#/# - CALC.	0.041

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	11.91
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	155.2
LIQ/GAS,GAL/MCF	15.0
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	5.8

VENT ABS.

76.41

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	97.8
SULFITE/SO2-MOL/MOL	=	5.26
SUMP RESID.TIME,MIN	=	9.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	*****
O2 AT FURN. EX.=	6.20
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-088		DATE 3-23-70		TIME OF DAY 1935		INPUT FOR EQ. - KIN.PROG.	
MATERIAL BALANCES						INPUT FLOWS, #ATOMS/100#FEED	
FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	CARBON
INPUT, #/HR		14.08	-----	28.17	211.9	5557.	0.400944
OUTPUT, #/HR		26.25	-----	*****	230.7	5563.	0.472024
PART. SCRUBBER							1.402044
INPUT, #/HR		26.25	-----	*****	2815.	5563.	5.116867
OUTPUT, #/HR		21.61	-----	*****	3031.	5200.	0.007601
SO2 ABSORBERS							FEED RATE, #/SEC= 1.61
INPUT, #/HR		21.61	*****	*****	1107.	5200.	ENTHALPY, BTU/# = 1546.
OUTPUT, #/HR		34.79	24.16	*****	1410.	5572.	
*SO2 ABSORBERS-PRODUCT COMP.							
		GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION		
TOTAL,		5.40	0.8443	-----	SLURRY CONC.- GM MGO/100ML = *****		
COMBINED		5.40	0.8443	-----	MGO PRESLAKED, NO=0, YES=1 0		
FREE		0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****		
MONO(TOTAL)		5.40	0.8443	-----	PRODUCT MG BASE PHYSICAL PROPERTIES		
MONO(DISSOLVED)		0.92	0.1437	-----	ACID STRENGTH, PH = *****		
MONO(SOLID)		4.48	0.7006	1.495	SP.GRAVITY, HYDROM. = *****		
BISULFITE		0.24	0.0188	14.852			
MGO		0.52	0.0814	0.349			
SULFATE		*****	*****	0.326			
MAGNESIUM		5.92	0.9257	*****	PARTICULATE SCRUBBER PRODUCT		
FLYASH		-----	-----	-----	ACID STRENGTH, PH = *****		
SOLIDS, MG		-----	-----	*****	FLYASH CONC. GM/100ML = *****		

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-089	CARD NUMBER	2	CARD NUMBER	3
DATE	3-23-70	WINDBOX ST,H2O	0.8100E 01	N.G. FLOW,SCALE	0.9800E 02
TIME	2055	BURNER DP,H2O	0.6100E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2200E 01	SCREW SPEED,RPM	0.3250E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	D2 FURN.EX.%-BM	0.6000E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.1800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2864E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9500E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	0.4900E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1380E 03
ABS LOAD,PSIG	0.3450E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7950E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6800E 03	PRI.AIR FAN IN.	0.7900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5650E 03	PRI.AIR WGT BULB	0.5800E 02
MODE OF OPER.	2	FURN. EXIT	0.1150E 03	SEC.AIR FAN IN.	0.3600E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR		SEC.AIR WET BULB	0.3600E 02
PART.SCR.DP,H2O	0.6000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5500E 01	VENT.ABS.DP,H2O	0.1300E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.9000E 00	ABS CYC.DP,H2O	0.4850E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01	CARD NUMBER	11	FBA DP,H2O	0.0
		TEMP.THERMOMETERS,F		FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	PART.CYC.EXIT	0.1340E 03	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1310E 03	ABS CYC.EXIT	0.1320E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.SUMP	0.1310E 03	PART.INIT.GAL	0.8036E 05
FBA INLET	0.0	ABS CYC.SUMP	0.0	PART.FINAL,GAL	0.8076E 05
FBA EXIT	0.0	FBA SUMP	0.0	PART.TIME,MIN	0.7900E 02
P.P.EXIT	0.1260E 03	MGO SLAK TANK	0.0	ABS H2O IN.GAL	0.1609E 05
PART.CYC.SUMP	0.1260E 03	MGOH2 TANK	0.8300E 02	ABS H2O FI.GAL	0.1615E 05
ABS CYC.SUMP	0.1270E 03			ABS H2O TIME,MIN	0.7900E 02
FBA SUMP	0.0			MGO ROTO.SCALE,%	0.5500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5500E 02
MGOH2 TANK	0.8100E 02				
MAKEUP WATER	0.5600E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-089

DATE 3-23-70

TIME OF DAY 2055

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	487.	115.0	-----	-----	-----	-----	0.007	49.6	483.	17.6
SECONDARY AIR	4892.	635.0	-----	-----	-----	-----	0.005	42.8	4867.	8.1
FURNACE EXIT	5743.	565.0	4555.1	-----	-----	-----	0.042	105.2	5513.	1.8
PART.SCRB.INLET	5743.	490.0	-----	-----	-----	-----	0.042	105.2	-----	1.4
PART.CYC.EXIT	5673.	134.0	4003.0	-----	-----	-----	0.094	129.9	5187.	-12.2
VENT ABS.INLET	5673.	134.0	-----	-----	-----	-----	0.094	129.9	-----	-16.6
ABS CYC.EXIT	6002.	132.0	-----	-----	-----	-----	0.079	123.1	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	6002.	126.0	1065.6	*****	*****	*****	0.079	123.1	5562.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	56.0	5.11	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	131.0	5.09	MAKEUP MGO SL.	56.0 6.2	*****
PRODUCT LIQ.	131.0	23.15	PRODUCT LIQ.	81.0 5.9	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	131.0 18.1	*****
			REC.(FLOW NOZ.)	131.0 504.0	*****
				436.3	*****

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,% DRY, MEAS.	CO2,% DRY-CALC.	HUMIDITY,#/# - CALC.
HEAT RELEASE,BTU/HR	0.484E 07	96.0	382.0	9.8	28.6	6.00	12.86	0.042
% FUEL AS COAL								
COAL FLOW RATE,#/HR								
NAT.GAS FLOW,#/HR								
% EXCESS AIR								
OXYGEN,% DRY, MEAS.								
CO2,% DRY-CALC.								
HUMIDITY,#/# - CALC.								

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 89.4

SULFITE/SO2-MOL/MOL = 5.14

SUMP RESID.TIME,MIN = 9.1

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2 = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0395

MOL% TOTAL SULF= 3.95

O2 AT FURN. EX.= 6.00

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-089 DATE 3-23-70 TIME OF DAY 2055 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FLOWS, #ATOMS/100#FEED
INPUT, #/HR	14.13	-----	28.27	211.5	5507.	CARBON 0.405863
OUTPUT, #/HR	26.45	-----	*****	230.5	5513.	HYDROGEN 0.459990
						OXYGEN 1.401448
						NITROGEN 5.112345
						SULFUR 0.007693

PART.SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

26.45
21.87

2790.
3035.

5513.
5187.

SG2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

21.87
44.81

18.05
32.92

1182.
1385.

5187.
5562.

ENTHALPY, BTU/# = 1473.

FEED RATE, #/SEC= 1.59

*
*SO2 ABSORBERS-
PRODUCT COMP.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 8.50
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE	6.85	1.0709	-----
	6.85	1.0709	-----
	0.0	0.0	-----
MONO(TOTAL)	6.85	1.0709	-----
MONO(DISSOLVED)	0.92	0.1437	1.495
MONO(SOLID)	5.93	0.9271	19.655
BISULFITE	0.24	0.0188	0.349
MGO	0.97	0.1512	0.605
SULFATE	0.25	0.0395	0.473
MAGNESIUM	8.07	1.2616	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	*****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-090	CARD NUMBER	2	CARD NUMBER	3
DATE	3-23-70	WINDBOX ST,H20	0.8200E 01	N.G. FLOW,%SCALE	0.9750E 02
TIME	2215	BURNER DP,H20	0.6100E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H20	0.2100E 01	SCREW SPEED,RPM	0.3250E 03
PRI.AIR DP,H20	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX,%-BM	0.6000E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H20	0.5000E 01	COMB.FURN.EX,%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.2100E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2863E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9700E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	0.5000E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.3800E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6420E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.8050E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6900E 03	PRI.AIR FAN IN.	0.8100E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5800E 03	PRI.AIR WGT BULB	0.6100E 02
MODE OF OPER.	2	FURN. EXIT	0.1150E 03	SEC.AIR FAN IN.	0.3600E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR		SEC.AIR WET BULB	0.3500E 02
PART.SCR.DP,H20	0.5900E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H20	0.5400E 01	VENT.ABS.DP,H20	0.1400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.9000E 00	ABS CYC.DP,H20	0.4900E 01	FBA SUMP DP,H20	0.0
#1 ORIF.DP,H20	0.4350E 01			FBA DP,H20	0.0
				FBA DEMIST.DP,H20	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1320E 03	TEMP.THERMOMETERS,F	0.1340E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1320E 03	PART.INIT.GAL	0.8077E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1320E 03	PART.FINAL,GAL	0.8119E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.8186E 02
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1615E 05
PART.CYC.SUMP	0.1270E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1622E 05
ABS CYC.SUMP	0.1270E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.8186E 02
FBA SUMP	0.0	MGOH2 TANK	0.7600E 02	MGO ROTO.SCALE,%	0.5400E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5400E 02
MGOH2 TANK	0.8100E 02				
MAKEUP WATER	0.5700E 02				

DATE 3-23-70 TIME OF DAY 2215

RUN NUMBER H-090

FLUE GAS DATA										STAT
FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	PRES IN.H2O	
486.	115.0	---	---	---	---	0.008	55.0	483.	17.6	
4883.	635.5	---	---	---	---	0.005	40.6	4860.	8.2	
5733.	580.0	4512.9	-----	-----	-----	0.042	105.1	5505.	2.1	
5733.	500.0	-----	-----	-----	-----	0.042	105.1	---	1.4	
5636.	134.0	4004.4	-----	-----	-----	0.096	130.6	5143.	-12.2	
5636.	134.0	-----	-----	-----	-----	0.096	130.6	---	-16.5	
5997.	132.0	-----	-----	-----	-----	0.081	123.9	---	-25.7	
-----	-----	-----	-----	-----	-----	-----	-----	---	-----	
-----	-----	-----	-----	-----	-----	-----	-----	---	-----	
5997.	126.0	1066.0	-----	-----	-----	0.081	123.9	5547.	-25.7	
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	

SCRUBBER STREAM DATA
 PARTICULATE
 MAKEUP WATER
 PRODUCT LIQ.
 RECIRCULATED LIQ.

VENTURI ABSORBER				FBA			
TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F FLOW,#/M	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
57.0	5.15	MAKEUP WATER	57.0 6.7	-----	-----	-----	-----
132.0	5.09	MAKEUP MGO SL.	81.0 5.8	-----	-----	-----	-----
132.0	23.15	PRODUCT LIQ.	132.0 18.1	-----	-----	-----	-----
		REC.(SPRAY NOZ)	132.0 504.0	-----	-----	-----	-----
		REC.(FLOW NOZ.)	436.3	-----	-----	-----	-----

FURNACE PERFORMANCE
 HEAT RELEASE,BTU/HR
 % FUEL AS COAL
 COAL FLOW RATE,#/HR
 NAT.GAS FLOW,#/HR
 % EXCESS AIR
 OXYGEN,%DRY,MEAS.
 CO2,%DRY-CALC.
 HUMIDITY,#/# - CALC.

SCRUBBER PERFORMANCE				VENT ABS.			
S02 ABSORB.EFF	FLYASH COL.EFF	S03 ABSORB.EFF	NOX ABSORB.EFF	GAS VELOCITY,FPS	LIQ/GAS,GAL/MCF	LIQ/GAS,#/#	PRES.DROP,IN.WG
0.484E 07	96.0	381.5	8.8	79.7	31.3	4.4	1.4
				154.6	15.1	2.1	5.9

S02 ABSORPTION PARAMETERS
 VENTURI ABSORBER

KGA,#MOLE/HR-FI2, = 89.2
 SULFITE/SO2-MOL/MOL = 6.05
 SUMP RESID.TIME,MIN = 9.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2
 SULFITE/SO2-MOL/MOL
 SUMP RESID.TIME,MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0411
 MOL% TOTAL SULF= 5.21
 O2 AT FURN.EX.= 6.00
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-090

DATE 3-23-70

TIME OF DAY 2215

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	14.11	---	---	28.23	210.0	5498.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	26.16	---	---	*****	228.9	5505.	CARBON	0.405882
							HYDROGEN	0.474519
PART. SCRUBBER							OXYGEN	1.401449
INPUT, #/HR	26.16	---	---	*****	2804.	5505.	NITROGEN	5.112326
OUTPUT, #/HR	21.69	---	---	*****	3042.	5143.	SULFUR	0.007694
							FEED RATE, #/SEC=	1.59
SO2 ABSORBERS							ENTHALPY, BTU/# =	1600.
INPUT, #/HR	21.69		17.83	*****	1215.	5143.		
OUTPUT, #/HR	35.58		21.53	*****	1428.	5547.		

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	5.15	0.8040	---	SLURRY CONC.- GM MGO/100ML = 8.50
COMBINED	5.02	0.7839	---	MGO PRESLAKED, NO=0, YES=1 0
FREE	0.13	0.0201	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	4.89	0.7638	---	
MONO(DISSOLVED)	1.08	0.1687	---	
MONO(SOLID)	3.81	0.5951	1.755	
BISULFITE	0.88	0.0688	12.616	
MGO	0.0	0.0	1.279	
SULFATE	0.26	0.0411	0.0	
MAGNESIUM	5.28	0.8250	0.493	
FLYASH	---	---	---	
SOLIDS, MG	---	---	*****	

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.40
SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-091				
DATE	3-23-70				
TIME	2330				
PRI. AIR ST, HG	0.1300E 01	WINDBOX ST, H2O	0.8100E 01	CARD NUMBER	3
PRI. AIR DP, H2O	0.2300E 01	BURNER DP, H2O	0.6100E 01	N.G. FLOW, %SCALE	0.9750E 02
SEC. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.2200E 01	N.G. STATIC, R.O.	0.8100E 01
SEC. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	SCREW SPEED, RPM	0.3250E 03
		PP EXIT DP, H2O	0.5000E 01	O2 FURN. EX. %BM	0.6100E 01
		FURN. EX. ST, H2O	0.2000E 01	COMB. FURN. EX. %	0.0
		PEEPSITE DP, HG	0.0	ELE. CHEM. MILVOLT	0.0
		P. SITE ST, PSIG	0.0	CELL TEMP, F	0.0
				BAROMETRIC, HG	0.2863E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1000E 03	PART. SCRUB. IN	0.5100E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1400E 03
ABS LOAD, PSIG	0.3800E 02	WINDBOX-WEST	0.6280E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4400E 01	WINDBOX-BOT.	0.6280E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8150E 03	PRI. AIR FAN IN.	0.8200E 02
		NO.2 BANK OUT	0.7000E 03	PRI. AIR WGT BULB	0.6000E 02
CARD NUMBER	7	FURN. EXIT	0.5880E 03	SEC. AIR FAN IN.	0.3600E 02
MODE OF OPER.	2	COAL-AIR	0.1150E 03	SEC. AIR WGT BULB	0.3500E 02
PART. SCR. ST, HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.1400E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.5400E 01	ABS CYC. DP, H2O	0.4900E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. ST, HG	-0.9000E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.4400E 01			FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1310E 03	PART. CYC. EXIT	0.1340E 03	PART. INIT. GAL	0.8120E 05
FBA INLET	0.0	ARS CYC. EXIT	0.1320E 03	PART. FINAL. GAL	0.8161E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.7654E 02
P.P. EXIT	0.1260E 03	ABS CYC. SUMP	0.1300E 03	ABS H2O IN. GAL	0.1622E 05
PART. CYC. SUMP	0.1260E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1629E 05
ABS CYC. SUMP	0.1270E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.7654E 02
FBA SUMP	0.0	MGOH2 TANK	0.7700E 02	MGO ROTO. SCALE, %	0.5300E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5300E 02
MGOH2 TANK	0.7700E 02				
MAKEUP WATER	0.5700E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-091

DATE 3-23-70

TIME OF DAY 2330

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	13.98	-----	27.97	207.9	5484.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	25.69	-----	*****	226.7	5490.	CARBON 0.403356
						HYDROGEN 0.463844
PART. SCRUBBER						OXYGEN 1.401742
INPUT, #/HR	25.69	-----	*****	2853.	5490.	NITROGEN 5.114652
OUTPUT, #/HR	23.45	-----	*****	3055.	5158.	SULFUR 0.007644

SO2 ABSORBERS

INPUT, #/HR	23.45	*****	*****	1323.	5158.	FEED RATE, #/SEC= 1.59
OUTPUT, #/HR	44.50	29.20	*****	1525.	5544.	ENTHALPY, BTU/# = 1779.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
COMBINED	6.18	0.9655	-----	SLURRY CONC.- GM MGO/100ML = *****
FREE	6.18	0.9655	-----	MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	6.18	0.9655	-----	
MONO(SOLID)	1.12	0.1750	-----	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	5.06	0.7905	1.820	ACID STRENGTH, PH = 6.30
MGO	0.52	0.0406	16.760	SP.GRAVITY, HYDROM. = 1.0620
SULFATE	0.0	0.0	0.756	
MAGNESIUM	0.23	0.0353	0.0	
FLYASH	6.41	1.0008	0.424	PARTICULATE SCRUBBER PRODUCT
SOLIDS, MG	-----	-----	-----	ACID STRENGTH, PH = *****
	-----	-----	-----	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-092	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST, H2O	0.8400E 01	N.G. FLOW, %SCALE	0.9750E 02
TIME	0100	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8100E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.2400E 01	SCREW SPEED, RPM	0.3200E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. % - BM	0.5800E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2863E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR DRIF.	0.1000E 03	PART. SCRUB. IN	0.5220E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1450E 03
ABS LOAD, PSIG	0.3850E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4400E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.8120E 03	PRI. AIR FAN IN.	0.8300E 02
		NO. 2 BANK OUT	0.7050E 03	PRI. AIR WGT BULB	0.6050E 02
CARD NUMBER	7	FURN. EXIT	0.5900E 03	SEC. AIR FAN IN.	0.3500E 02
MODE OF OPER.	2	COAL-AIR	0.1180E 03	SEC. AIR WET BULB	0.3400E 02
PART. SCR. ST, HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.1400E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.5500E 01	ABS CYC. DP, H2O	0.4900E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. ST, HG	-0.9000E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.4350E 01			FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1320E 03	PART. CYC. EXIT	0.1350E 03	PART. INIT. GAL	0.8161E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1320E 03	PART. FINAL. GAL	0.8213E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.9775E 02
P. P. EXIT	0.1270E 03	ABS CYC. SUMP	0.1320E 03	ABS H2O IN. GAL	0.1630E 05
PART. CYC. SUMP	0.1280E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1639E 05
ABS CYC. SUMP	0.1280E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.9775E 02
FBA SUMP	0.0	MGOH2 TANK	0.8000E 02	MGO ROTO. SCALE, %	0.5300E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5300E 02
MGOH2 TANK	0.7800E 02				
MAKEUP WATER	0.5800E 02				

RUN NUMBER H-092

DATE 3-24-70 TIME OF DAY 0100

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	485.	118.0	---	---	---	---	0.007	52.4	482.	17.6
SECONDARY AIR	4870.	640.0	---	---	---	---	0.005	39.5	4848.	8.4
FURNACE EXIT	5723.	590.0	4320.8	---	---	---	0.042	105.3	5494.	2.2
PART. SCRUB. INLET	5723.	522.0	---	---	---	---	0.042	105.3	---	1.4
PART. CYC. EXIT	5623.	135.0	4205.4	---	---	---	0.102	132.7	5102.	-12.2
VENT ABS. INLET	5623.	135.0	---	---	---	---	0.102	132.7	---	-16.5
ABS CYC. EXIT	5987.	132.0	---	---	---	---	0.085	125.4	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5987.	127.0	946.4	*****	*****	*****	0.085	125.4	5518.	-25.7

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE				TEMP, F	FLOW, #/M
MAKEUP WATER	58.0	5.36	MAKEUP WATER	58.0	*****
PRODUCT LIQ.	132.0	5.09	MAKEUP MGO SL.	78.0	*****
RECIRCULATED LIQ.	132.0	23.15	PRODUCT LIQ.	132.0	*****
			REC. (SPRAY NOZ)	132.0	*****
			REC. (FLOW NOZ.)	504.0	*****
				436.3	*****

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.489E 07
% FUEL AS COAL	96.0
COAL FLOW RATE, #/HR	385.7
NAT. GAS FLOW, #/HR	8.8
% EXCESS AIR	27.6
OXYGEN, % DRY, MEAS.	5.80
CO2, % DRY-CALC.	13.04
HUMIDITY, #/# - CALC.	0.042

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	2.67
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	155.0
LIQ/GAS, GAL/MCF	15.1
LIQ/GAS, #/#	2.1
PRES. DROP, IN. WG	6.0

VENT ABS.

77.49

79.7
31.3
4.4
1.4

FLOAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, # MOLE/HR-FT2,	=	99.9
SULFITE/SO2-MOL/MOL	=	5.26
SUMP RESID. TIME, MIN	=	8.1

FLOATING BED ABSORBER

KGA, # MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID. TIME, MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0314
MOL% TOTAL SULF=	3.53
O2 AT FURN. EX.=	5.80
O2 AT ABSORB. IN=	*****
O2 AT ABSORB. EX=	*****

***** MEANS ITEM NOT MEASURED

TIME OF DAY 0100

RUN NUMBER H-092

DATE 3-24-70

TIME OF DAY 0100

INPUT FOR EQ. - KIN. PROG.

MATERIAL BALANCES

INPUT FLOWS, #ATOMS/100 #FEED

CARBON 0.410886

HYDROGEN 0.471513

OXYGEN
1-400864

NITROGEN 5-107719

SULFUR 0.007791

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 1708.

1329.
1553.
5102.
5518.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =

MGO PRESLAKED, NO=0, YES=1 0

SLAKED TO MG(OH)2, MEAS.

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.40

SP-GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER · PRODUCT

ACID STRENGTH, PH

FLYASH CONC. GM/100ML =

11.801

COAL COMPOSITION-MASS

CARBON **0.7150**

HYDROGEN 0.0485

OXY+NI 0.0817

SULFUR 0.0370

ASH 0.0740

WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-093	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST,H2O	0.8400E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	0245	BURNER DP,H2O	0.5900E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2700E 01	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.5900E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2700E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2863E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1050E 03	PART.SCRUB.IN	0.5250E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.3850E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8350E 03	PRI.AIR FAN IN.	0.8100E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7200E 03	PRI.AIR WGT BULB	0.6100E 02
MODE OF OPER.	2	FURN. EXIT	0.6050E 03	SEC.AIR FAN IN.	0.3600E 02
PART.SCR.ST,HG	0.5000E-01	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.3500E 02
PART.SCR.DP,H2O	0.5900E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5500E 01	VENT.ABS.DP,H2O	0.1400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8500E 00	ABS CYC.DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4300E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1320E 03	PART.CYC.EXIT	0.1350E 03	PART.INIT.GAL	0.8214E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1340E 03	PART.FINAL,GAL	0.8258E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.8275E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.1330E 03	ABS H2O IN.GAL	0.1639E 05
PART.CYC.SUMP	0.1280E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1645E 05
ABS CYC.SUMP	0.1290E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.8275E 02
FBA SUMP	0.0	MGOH2 TANK	0.8300E 02	MGO ROTO.SCALE,%	0.5500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5500E 02
MGOH2 TANK	0.8300E 02				
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-093

DATE 3-24-70

TIME OF DAY 0245

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	484.	120.0	-----	-----	-----	-----	0.008	55.0	480.	17.6
SECONDARY AIR	4848.	642.5	-----	-----	-----	-----	0.005	40.6	4825.	8.4
FURNACE EXIT	5696.	605.0	4459.3	-----	-----	-----	0.042	105.3	5468.	2.7
PART.SCRB.INLET	5696.	525.0	-----	-----	-----	-----	0.042	105.3	-----	0.7
PART.CYC.EXIT	5595.	135.0	4352.3	-----	-----	-----	0.102	132.8	5075.	-11.5
VENT ABS.INLET	5595.	135.0	-----	-----	-----	-----	0.102	132.8	-----	-15.8
ABS CYC.EXIT	5983.	134.0	-----	-----	-----	-----	0.084	125.1	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5983.	128.0	1065.0	*****	*****	*****	0.084	125.1	5519.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	58.0	5.30	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	132.0	5.09	MAKEUP MGO SL.	6.0	*****
RECIRCULATED LIQ.	132.0	23.15	PRODUCT LIQ.	5.9	*****
			REC.(SPRAY NOZ)	20.2	*****
			REC.(FLOW NOZ.)	504.0	*****
				436.3	*****

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,% DRY, MEAS.	CO2,% DRY-CALC.	HUMIDITY,#/# - CALC.
	0.484E 07	96.0	381.2	8.8	28.1	5.90	12.95	0.042

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 94.3

SULFITE/SO2-MOL/MOL = 4.87

SUMP RESID.TIME,MIN = 8.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0388

MOL% TOTAL SULF= 4.54

O2 AT FURN.EX.= 5.90

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-093

DATE 3-24-70

TIME OF DAY 0245

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE INPUT, #/HR 14.11

OUTPUT, #/HR 25.67

MAGNESIUM FLYASH 28.21

WATER 209.7

228.7

DRY GAS 5462.

5468.

PART.SCRUBBER INPUT, #/HR 25.67

OUTPUT, #/HR 23.25

2882.

3069.

5468.

5075.

SO2 ABSORBERS INPUT, #/HR 23.25

OUTPUT, #/HR 42.37

1206.

1554.

5075.

5519.

*

*SO2 ABSORBERS-PRODUCT COMP.

GM SO2/100ML

GM-MOLE/LITER

GRAM/100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 8.60

MGO PRESLAKED, NO=0, YES=1 0

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.30

SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.408326

HYDROGEN 0.476999

OXYGEN 1.401152

NITROGEN 5.110079

SULFUR 0.007739

FEED RATE, #/SEC= 1.58

ENTHALPY, BTU/# = 1708.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-094	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST, H2O	0.8200E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	0410	BURNER DP, H2O	0.5900E 01	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.2400E 01	SCREW SPEED, RPM	0.3200E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. % - BM	0.6100E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.2600E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2863E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1050E 03	PART. SCRUB. IN	0.5350E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.3850E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF. INCH	0.3100E 01	WINDBOX-80T.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8600E 03	PRI. AIR FAN IN.	0.8300E 02
		NO.2 BANK OUT	0.7350E 03	PRI. AIR WGT BULB	0.6300E 02
CARD NUMBER	7	FURN. EXIT	0.6200E 03	SEC. AIR FAN IN.	0.3500E 02
MODE OF OPER.	2	COAL-AIR	0.1200E 03	SEC. AIR WET BULB	0.3400E 02
PART. SCR. ST, HG	0.5000E-01				
PART. SCR. DP, H2O	0.5900E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5600E 01	VENT. ABS. DP, H2O	0.1200E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.9000E 00	ABS CYC. DP, H2O	0.4700E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4400E 01			FBA DP, H2O	0.0
				FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1330E 03	PART. CYC. EXIT	0.1360E 03	PART. INIT. GAL	0.8259E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1340E 03	PART. FINAL, GAL	0.8308E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1330E 03	PART. TIME, MIN	0.9480E 02
P.P. EXIT	0.1280E 03	ABS CYC. SUMP	0.1320E 03	ABS H2O IN. GAL	0.1645E 05
PART. CYC. SUMP	0.1280E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1653E 05
ABS CYC. SUMP	0.1290E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.9475E 02
FBA SUMP	0.0	MGOH2 TANK	0.7400E 02	MGO ROTO. SCALE, %	0.5100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5100E 02
MGOH2 TANK	0.7300E 02				
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-094

DATE 3-24-70

TIME OF DAY 0410

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	484.	120.0	---	---	---	---	0.009	57.9	480.	17.6
SECONDARY AIR	4848.	645.0	---	---	---	---	0.005	39.5	4827.	8.2
FURNACE EXIT	5692.	620.0	4483.1	---	---	---	0.041	104.9	5466.	2.6
PART.SCRB.INLET	5692.	535.0	---	---	---	---	0.041	104.9	---	0.7
PART.CYC.EXIT	5647.	136.0	4264.5	---	---	---	0.103	132.9	5119.	-12.2
VENT ABS.INLET	5647.	136.0	---	---	---	---	0.103	132.9	---	-16.6
ABS CYC.EXIT	5984.	134.0	---	---	---	---	0.082	124.2	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5934.	128.0	964.3	*****	*****	*****	0.082	124.2	5531.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	58.0	5.22	MAKEUP WATER	58.0 7.3	*****
MAKEUP WATER	133.0	5.09	MAKEUP MGD SL.	73.0 5.6	*****
PRODUCT LIQ.	133.0	23.15	PRODUCT LIQ.	132.0 22.6	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	132.0 577.4	*****
			REC.(FLOW NOZ.)	366.2	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.477E 07
% FUEL AS COAL	95.9
COAL FLOW RATE,#/HR	376.1
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	29.0
OXYGEN,% DRY, MEAS.	6.10
CO2,% DRY-CALC.	12.78
HUMIDITY,#/# - CALC.	0.041

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	4.88
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
G/S VELOCITY,FPS	156.1
LIQ/GAS,GAL/MCF	14.9
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.9

VENT ABS.

77.39

79.9
26.2
3.7
1.2

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	99.9
SULFITE/SO2-MOL/MOL	=	3.81
SUMP RESID.TIME,MIN	=	7.3

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0300
MOL% TOTAL SULF=	3.41
O2 AT FURN.EX.=	6.10
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

**** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-094

DATE 3-24-70

TIME OF DAY 0410

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	13.92	---	---	27.83	206.8	5460.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	25.82	---	---	*****	225.8	5466.	CARBON 0.403305	
							HYDROGEN 0.481572	
							OXYGEN 1.401737	
							NITROGEN 5.114701	
							SULFUR 0.007642	
PART-SCRUBBER								
INPUT, #/HR	25.82	---	---	*****	2836.	5466.		
OUTPUT, #/HR	23.00	---	---	*****	3077.	5119.		

FEED RATE, #/SEC= 1.58

ENTHALPY, BTU/# = 1935.

1302.
1654.

5119.
5531.

*

*SO2 ABSORBERS- PRODUCT COMP.

INPUT, #/HR	23.00	*****	*****	GRAM/ 100ML
OUTPUT, #/HR	48.14	33.53	*****	100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.30
SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-095	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST,H2O	0.8600E 01	N.G. FLOW,%SCALE	0.9750E 02
TIME	0530	BURNER DP,H2O	0.5900E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2800E 01	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.6300E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2863E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1080E 03	PART.SCRUB.IN	0.5400E 03
ABS NOZ.,PSIG	0.2500E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.3850E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF,INCH	0.2900E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6480E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8420E 03	PRI.AIR FAN IN.	0.8300E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7400E 03	PRI.AIR WGT BULB	0.6100E 02
MODE OF OPER.	2	FURN. EXIT	0.6300E 03	SEC.AIR FAN IN.	0.3700E 02
PART.SCR.ST,HG	0.5000E-01	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.3600E 02
PART.SCR.DP,H2O	0.6100E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5500E 01	VENT.ABS.DP,H2O	0.1200E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.9000E 00	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4300E 01	CARD NUMBER	11	FBA DP,H2O	0.0
CARD NUMBER	10	TEMP.THERMOMETERS,F		FBA DEMIST.DP,H2O	0.0
TEMP.PILOT RECORDER,F		PART.CYC.EXIT	0.1360E 03	CARD NUMBER	12
#1 ORIFICE	0.1320E 03	ABS CYC.EXIT	0.1330E 03	MAKEUP FLOWS	
FBA INLET	0.0	PART.CYC.SUMP	0.1330E 03	PART.INIT.GAL	0.8309E 05
FBA EXIT	0.0	ABS CYC.SUMP	0.1320E 03	PART.FINAL,GAL	0.8349E 05
P.P.EXIT	0.1280E 03	FBA SUMP	0.0	PART.TIME,MIN	0.7450E 02
PART.CYC.SUMP	0.1280E 03	MGO SLAK TANK	0.0	ABS H2O IN.GAL	0.1653E 05
ABS CYC.SUMP	0.1280E 03	MGOH2 TANK	0.7600E 02	ABS H2O FI.GAL	0.1670E 05
FBA SUMP	0.0			ABS H2O TIME,MIN	0.7450E 02
MGO SLAK TANK	0.0			MGO ROTO.SCALE,%	0.5100E 02
MGOH2 TANK	0.7600E 02			MAKEUP SETTING	0.5100E 02
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-095

DATE 3-24-70

TIME OF DAY 0530

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	13.69	---	---	27.38	205.0	5443.	
OUTPUT, #/HR	27.93	---	---	*****	223.9	5449.	
PART. SCRUBBER							
INPUT, #/HR	27.93	---	---	*****	2897.	5449.	
OUTPUT, #/HR	25.22	---	---	*****	3077.	5051.	

SO2 ABSORBERS	
INPUT, #/HR	25.22
OUTPUT, #/HR	44.48

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE	6.21	0.9701	---
MONO(TOTAL)	6.21	0.9701	---
MONO(DISSOLVED)	0.90	0.0	---
MONO(SOLID)	5.31	0.1406	---
BISULFITE	0.32	0.8294	1.462
MGO	0.11	0.0250	17.584
SULFATE	0.25	0.0172	0.465
MAGNESIUM	6.57	0.0388	0.069
FLYASH	---	1.0260	0.465
SOLIDS, MG	---	---	---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.398281
HYDROGEN 0.463882
OXYGEN 1.402325
NITROGEN 5.119328
SULFUR 0.007544

FEED RATE, #/SEC= 1.58

ENTHALPY, BTU/# = 1930.

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.30
SP.GRAVITY, HYDROM. = 1.0640

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-096	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST,H2O	0.8500E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	0715	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2600E 01	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.2000E 01	O2 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2865E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1000E 03	PART.SCRUB.IN	0.5500E 03
ABS NOZ.,PSIG	0.2400E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.2600E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8600E 03	PRI.AIR FAN IN.	0.8200E 02
		NO.2 BANK OUT	0.7500E 03	PRI.AIR WGT BULB	0.6300E 02
CARD NUMBER	7	FURN. EXIT	0.6350E 03	SEC.AIR FAN IN.	0.3300E 02
MODE OF OPER.	2	COAL-AIR	0.1180E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1500E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.6400E 01	VENT.ABS.DP,H2O	0.1100E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.5700E 01	ABS CYC.DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.9000E 00			FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4300E 01			FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.8349E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1350E 03	PART.FINAL,GAL	0.8381E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1350E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.1350E 03	ABS H2O IN.GAL	0.1660E 05
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1666E 05
ABS CYC.SUMP	0.1300E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.8100E 02	MGO ROTO.SCALE,%	0.5000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5000E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER H-096

DATE 3-24-70

TIME OF DAY 0715

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	474.	118.0	-----	-----	-----	-----	0.009	58.6	470.	17.6
SECONDARY AIR	4888.	640.0	-----	-----	-----	-----	0.004	37.6	4868.	8.5
FURNACE EXIT	5732.	635.0	4706.1	-----	-----	-----	0.042	105.2	5502.	2.5
PART.SCRB.INLET	5732.	550.0	-----	-----	-----	-----	0.042	105.2	-----	2.0
PART.CYC.EXIT	5576.	137.0	4604.5	-----	-----	-----	0.107	134.2	5036.	-12.2
VENT ABS.INLET	5576.	137.0	-----	-----	-----	-----	0.107	134.2	-----	-16.5
ABS CYC.EXIT	5974.	135.0	-----	-----	-----	-----	0.084	125.1	-----	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5974.	128.0	1019.7	*****	*****	*****	0.084	125.1	5509.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.26	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	135.0	5.09	MAKEUP MGD SL.	8.6	*****
RECIRCULATED LIQ.	135.0	23.15	PRODUCT LIQ.	5.5	*****
			REC.(SPRAY NOZ)	23.9	*****
			REC.(FLOW NOZ.)	563.5	*****
				335.4	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.490E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED.
% FUEL AS COAL	96.0	SO2 ABSORB.EFF	2.16	77.85	*****
COAL FLOW RATE,#/HR	386.2	FLYASH COL.EFF	*****	*****	*****
NAT.GAS FLOW,#/HR	8.8	SO3 ABSORB.EFF	*****	*****	*****
% EXCESS AIR	27.6	NOX ABSORB.EFF	*****	*****	*****
OXYGEN,% DRY, MEAS.	5.80	GAS VELOCITY,FPS	154.5	80.2	*****
CO2,% DRY-CALC.	13.04	LIQ/GAS,GAL/MCF	15.1	23.9	*****
HUMIDITY, #/# - CALC.	0.042	LIQ/GAS, #/#	2.1	3.4	*****
		PRES.DROP, IN.WG	6.4	1.1	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 100.8
 SULFITE/SO2-MOL/MOL = 2.26
 SUMP RESID.TIME, MIN = 5.5
 ***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2
 SULFITE/SO2-MOL/MOL
 SUMP RESID.TIME, MIN

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L = 0.0295
 MOL% TOTAL SULF = 3.75
 O2 AT FURN. EX. = 5.80
 O2 AT ABSORB. IN = *****
 O2 AT ABSORB. EX = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-096 DATE 3-24-70 TIME OF DAY 0715

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	14.29	---	---	28.58	210.1	5496.	
OUTPUT, #/HR	27.25	---	---	*****	229.1	5502.	
PART. SCRUBBER							
INPUT, #/HR	27.25	---	---	*****	2860.	5502.	
OUTPUT, #/HR	24.41	---	---	*****	3089.	5036.	

SO2 ABSORBERS
INPUT, #/HR 24.41
OUTPUT, #/HR 45.20

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	5.28	GM SO2 /	GM-MOLE /	GRAM /
COMBINED	5.22	100ML	LITER	100ML
FREE	0.07			
MONO(TOTAL)	5.15			
MONO(DISSOLVED)	0.60			
MONO(SOLID)	4.55			
BISULFITE	0.28			
MGO	0.0			
SULFATE	0.19			
MAGNESIUM	5.41			
FLYASH	---			
SOLIDS, MG	---			

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.410863
HYDROGEN 0.490066
OXYGEN 1.400862
NITROGEN 5.107741
SULFUR 0.007789

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 1820.

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 8.60
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.30
SP.GRAVITY, HYDROM. = 1.0650

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-097	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST, H2O	0.6900E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	0855	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.3200E 01	SCREW SPEED, RPM	0.3200E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.2000E 01	O2 FURN. EX. %BM	0.6000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.3000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2866E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1000E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.6500E 03	PART. SCRUB. IN	0.5500E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1400E 03
ABS LOAD, PSIG	0.3900E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF. INCH	0.2400E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.8750E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7500E 03	PRI. AIR FAN IN.	0.8200E 02
		NO.2 BANK OUT	0.6300E 03	PRI. AIR WGT BULB	0.6300E 02
		FURN. EXIT	0.1100E 03	SEC. AIR FAN IN.	0.3300E 02
		COAL-AIR		SEC. AIR WET BULB	0.3200E 02
CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MUDE OF OPER.	2	CARD NUMBER	8	FBA INLET ST, HG	0.0
PART. SCR. ST, HG	0.2000E 00	VENT. ABS. DP, H2O	0.1100E 01	FBA SUMP DP, H2O	0.0
PART. SCR. DP, H2O	0.6400E 01	ABS CYC. DP, H2O	0.4600E 01	FBA DP, H2O	0.0
PART. CYC. DP, H2O	0.5600E 01			FBA DEMIST. DP, H2O	0.0
#1 ORIF. ST, HG	-0.9000E 00				
#1 ORIF. DP, H2O	0.4300E 01				
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1320E 03	TEMP. THERMOMETERS, F	0.1360E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1360E 03	PART. INIT. GAL	0.8381E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1360E 03	PART. FINAL, GAL	0.8465E 05
FBA EXIT	0.1300E 03	PART. CYC. SUMP	0.1360E 03	PART. TIME, MIN	0.9700E 02
P. P. EXIT	0.1300E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1666E 05
PART. CYC. SUMP	0.1310E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1679E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.9700E 02
FBA SUMP	0.0	MGOH2 TANK	0.8600E 02	MGO ROTO. SCALE, %	0.5000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5000E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

*** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-097 DATE 3-24-70 TIME OF DAY 0855

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.09	-----	28.17	207.5	5489.
OUTPUT, #/HR	26.00	-----	*****	226.5	5495.
PART. SCRUBBER					
INPUT, #/HR	26.00	-----	*****	4566.	5495.
OUTPUT, #/HR	21.43	-----	*****	3157.	4950.
SO2 ABSORBERS					
INPUT, #/HR	21.43	*****	*****	1602.	4950.
OUTPUT, #/HR	49.19	33.00	*****	1723.	5380.

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.405839
HYDROGEN	0.486120
OXYGEN	1.401446
NITROGEN	5.112367
SULFUR	0.007692

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 1799.

* *SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	GM SO2/100ML	GRAM/100ML	MAKEUP MGD COMPOSITION
COMBINED	6.39	-----	SLURRY CONC.- GM MGO/100ML = *****
FREE	6.39	-----	MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	6.39	-----	
MONO(SOLID)	0.62	1.007	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	5.77	19.100	ACID STRENGTH, PH = 6.40
MGO	0.60	0.872	SP.GRAVITY, HYDROM. = 1.0650
SULFATE	0.0	0.0	
MAGNESIUM	0.22	0.415	PARTICULATE SCRUBBER PRODUCT
FLYASH	6.61	-----	ACID STRENGTH, PH = *****
SOLIDS, MG	-----	*****	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	H-098	CARD NUMBER	2	3
DATE	3-24-70	WINDBOX ST,H2O	0.6900E 01	0.9800E 02
TIME	1010	BURNER DP,H2O	0.6000E 01	0.8000E 01
PRI-AIR ST, HG	0.1400E 01	FURN. ST,H2O	0.3600E 01	0.3200E 03
PRI-AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-.1900E 01	0.6000E 01
SEC-AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	0.0
SEC-AIR DP,H2O	0.2400E 01	FURN-EX-ST,H2O	0.3600E 01	0.0
		PEEPSITE DP,HG	0.0	0.0
		P-SITE ST,PSIG	0.0	0.2867E 02
		CARD NUMBER		
		N.G. FLOW,%SCALE		
		N.G. STATIC,R.O.		
		SCREW SPEED,RPM		
		O2 FURN-EX-%-BM		
		COMB.FURN,EX.%		
		ELE-CHEM.MILVOLT		
		CELL TEMP,F		
		BAROMETRIC,HG		

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9900E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	0.5550E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6200E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.6000E 02	WINDBOX-WEST	0.6200E 03	FBA INLET	0.0
ABS ORIF.INCH	0.2000E 01	WINDBOX-BOT.	0.6200E 03	AIR HEATER #1	0.7000E 03
ABSORBER NDZ. CODE		WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE		NO.1 BANK OUT	0.8750E 03	PRI.AIR FAN IN.	0.8800E 02
		NO.2 BANK OUT	0.7600E 03	PRI.AIR WGT BULB	0.5900E 02
		FURN. EXIT	0.6400E 03	SEC.AIR FAN IN.	0.3700E 02
		COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.3200E 02
CARD NUMBER	7				
MODE OF OPER.	2				
PART SCR ST UC					

9		8	
CARD NUMBER		CARD NUMBER	
FBA INLET ST,HG	0.0	FBA INLET ST,HG	0.0
FBA SUMP DP,H2O	0.0	FBA SUMP DP,H2O	0.0
FBA DP,H2O	0.0	FBA DP,H2O	0.0
FBA DEMIST.DP,H2O	0.0	FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.8465E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1360E 03	PART.FINAL,GAL	0.8505E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1360E 03	PART.TIME,MIN	0.7200E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.1360E 03	ABS H2O IN,GAL	0.1679E 05
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.0	ABS H2O FI,GAL	0.1682E 05
ABS CYC.SUMP	0.1310E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.7200E 02
FBA SUMP	0.0	MGOH2 TANK	0.7500E 02	MGO ROTO.SCALE,%	0.5000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5000E 02
MGOH2 TANK	0.7500E 02				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-098

DATE 3-24-70

TIME OF DAY 1010

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	490.	110.0	---	---	---	---	0.005	43.8	487.	19.0
SECONDARY AIR	4993.	632.5	---	---	---	---	0.003	31.8	4976.	6.9
FURNACE EXIT	5855.	640.0	4287.8	---	---	---	0.040	104.1	5629.	3.6
PART.SCRB.INLET	5855.	555.0	---	---	---	---	0.040	104.1	---	1.4
PART.CYC.EXIT	5586.	137.0	3776.5	---	---	---	0.108	134.6	5042.	-10.8
VENT ABS.INLET	5586.	137.0	---	---	---	---	0.108	134.6	---	-15.1
ABS CYC.EXIT	5927.	136.0	---	---	---	---	0.115	135.0	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	5927.	130.0	1160.6	*****	*****	*****	0.115	135.0	5317.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	5.49	---	60.0 2.9	---
MAKEUP WATER	136.0	5.09	MAKEUP MGO SL.	75.0 5.5	---
PRODUCT LIQ.	136.0	23.15	PRODUCT LIQ.	136.0 0.0	---
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	136.0 504.0	---
			REC.(FLOW NOZ.)	294.2	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.495E 07
% FUEL AS COAL	96.1
COAL FLOW RATE,#/HR	390.3
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	28.6
OXYGEN,%DRY,MEAS.	6.00
CO2,%DRY-CALC.	12.87
HUMIDITY,#/# - CALC.	0.040

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	11.92
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	154.2
LIQ/GAS,GAL/MCF	15.1
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2,	=	76.2
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0623
MOL% TOTAL SULF=	13.12
O2 AT FURN.E.=	6.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-098

DATE 3-24-70

TIME OF DAY 1010

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.
INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.405974
HYDROGEN 0.446046
OXYGEN 1.401458
NITROGEN 5.112235
SULFUR 0.007699
FEED RATE, #/SEC = 1.63
ENTHALPY, BTU/# = 2298.

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.44	---	28.89	206.8	5623.
OUTPUT, #/HR	25.42	---	*****	225.8	5629.
PART. SCRUBBER					
INPUT, #/HR	25.42	---	*****	2973.	5629.
OUTPUT, #/HR	20.05	---	*****	3093.	5042.
SO2 ABSORBERS					
INPUT, #/HR	20.05	17.32	*****	1022.	5042.
OUTPUT, #/HR	6.50	*****	*****	611.	5317.

* SO2 ABSORBERS-PRODUCT COMP.
TOTAL, 2.64
COMBINED 2.64
FREE 0.0
MONO(TOTAL) 2.64
MONO(DISSOLVED) *****
MONO(SOLID) *****
BISULFITE *****
MGO 0.20
SULFATE 0.40
MAGNESIUM 3.24
FLYASH ---
SOLIDS, MG ---

GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
2.64	0.4125	---
2.64	0.4125	---
0.0	0.0	---
2.64	0.4125	---
*****	*****	*****
*****	*****	*****
*****	*****	*****
0.20	0.0312	0.125
0.40	0.0623	0.748
3.24	0.5060	---
---	---	0.675
---	---	*****

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGD/100ML = 8.70
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****
PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.50
SP.GRAVITY, HYDROM. = 1.0680

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-099	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST,H20	0.7500E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1130	BURNER DP,H20	0.6000E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST,HG	0.1200E 01	FURN. ST,H20	0.4200E 01	SCREW SPEED,RPM	0.3150E 03
PAI.AIR DP,H20	0.2100E 01	PP EXIT ST,HG	-0.1900E 01	02 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1800E 01	PP EXIT DP,H20	0.5000E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.4000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2868E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.1000E 03	PART.SCRUB.IN	0.5600E 03
ABS NOZ.,PSIG	0.1800E 02	WINDBOX-TOP	0.6400E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.6200E 03	FBA INLET	0.0
ABS ORIF.INCH	0.1600E 01	WINDBOX-BOT.	0.6200E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6350E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8700E 03	PRI.AIR FAN IN.	0.8600E 02
		NO.2 BANK OUT	0.7700E 03	PRI.AIR WGT BULB	0.6900E 02
CARD NUMBER	7	FURN. EXIT	0.6400E 03	SEC.AIR FAN IN.	0.3600E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1500E 00				
PART.SCR.DP,H20	0.6400E 01				
PART.CYC.DP,H20	0.5200E 01				
#1 ORIF.ST,HG	-0.9000E 00				
#1 ORIF.DP,H20	0.4300E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H20	0.1000E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H20	0.4500E 01	FBA SUMP DP,H20	0.0
		FBA DP,H20	0.0
		FBA DEMIST.DP,H20	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1320E 03	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.8505E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1360E 03	PART.FINAL,GAL	0.8545E 05

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-099 DATE 3-24-70 TIME OF DAY 1130

FLUE GAS DATA										
	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	466.	110.0	---	---	---	---	0.012	67.6	460.	16.3
SECONDARY AIR	4916.	628.8	---	---	---	---	0.004	33.7	4899.	7.5
FURNACE EXIT	5752.	640.0	4392.9	---	0.	---	0.041	105.1	5523.	4.0
PART. SCRUB. INLET	5752.	560.0	---	---	---	---	0.041	105.1	---	2.0
PART. CYC. EXIT	5578.	137.0	4209.7	---	---	---	0.108	134.5	5035.	-12.2
VENT. ABS. INLET	5578.	137.0	---	---	---	---	0.108	134.5	---	-16.5
ABS. CYC. EXIT	5968.	136.0	---	---	---	---	0.091	127.7	---	-25.7
FLOATING BED IN	---	---	---	---	---	---	---	---	---	---
FLOATING BED EX	---	---	---	---	---	---	---	---	---	---
P.P. EXIT ORIF.	5968.	130.0	1174.6	---	888.	---	0.091	127.7	5470.	-25.7

SCRUBBER STREAM DATA				VENTURI ABSORBER				FBA	
	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M		
PARTICULATE	60.0	5.06	MAKEUP WATER	60.0	10.6	---	---	---	---
MAKEUP WATER	136.0	5.09	MAKEUP MGD SL.	76.0	5.5	---	---	---	---
PRODUCT LIQ.	136.0	23.15	PRODUCT LIQ.	135.0	20.2	---	---	---	---
RECIRCULATED LIQ.	---	---	REC. (SPRAY NOZ)	135.0	471.4	---	---	---	---
---	---	---	REC. (FLOW NOZ.)	---	263.1	---	---	---	---

FURNACE PERFORMANCE				SCRUBBER PERFORMANCE				FLOAT. BED	
	HEAT RELEASE, BTU/HR	% FUEL AS COAL	COAL FLOW RATE, #/HR		SO2 ABSORB. EFF	FLYASH COL. EFF	SO3 ABSORB. EFF	VENT ABS.	
HEAT RELEASE, BTU/HR	0.491E 07	96.0	387.8	PART.	4.17	---	---	72.10	---
% FUEL AS COAL	---	---	---	---	---	---	---	---	---
COAL FLOW RATE, #/HR	---	---	---	---	---	---	---	---	---
NAT. GAS FLOW, #/HR	---	---	---	---	---	---	---	---	---
% EXCESS AIR	27.6	8.8	---	---	---	---	---	80.1	---
OXYGEN, % DRY, MEAS.	5.80	---	---	---	---	---	---	18.8	---
CO2, % DRY - CALC.	13.04	---	---	---	---	---	---	2.6	---
HUMIDITY, #/# - CALC.	0.041	---	---	---	---	---	---	1.0	---

S02 ABSORPTION PARAMETERS				VENTURI ABSORBER				SULFATE FORMATION PARAMETERS			
	KGA, #MOLE/HR-FT2,	=	84.7		SO2 ABSORB. EFF	FLYASH COL. EFF	SO3 ABSORB. EFF		CONC., GM-MOLE/L=	0.0856	
KGA, #MOLE/HR-FT2,	---	---	---	---	---	---	---	---	MDL% TOTAL SULF=	8.75	---
SULFITE/SO2-MOL/MOL	---	---	---	---	---	---	---	---	O2 AT FURN. EX.=	5.80	---
SUMP RESID. TIME, MIN	6.5	---	---	---	---	---	---	---	O2 AT ABSORB. IN=	---	---
---	---	---	---	---	---	---	---	---	O2 AT ABSORB. EX=	---	---

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-099

DATE 3-24-70

TIME OF DAY 1130

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	14.35			28.69	209.4	5517.	
OUTPUT, #/HR	25.54			*****	228.4	5523.	
PART. SCRUBBER							
INPUT, #/HR	25.54			*****	2759.	5523.	
OUTPUT, #/HR	22.31			*****	3092.	5035.	

S02 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

22.31
48.35
17.48
31.94

*

*S02 ABSORBERS-
PRODUCT COMP.

GM S02/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 8.90
MGO PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL, 6.31
COMBINED 6.31
FREE 0.0
MONO(TOTAL) 6.31
MONO(DISSOLVED) *****
MONO(SOLID) *****
BISULFITE *****
MGO 0.15
SULFATE 0.55
MAGNESIUM 7.01
FLYASH -----
SOLIDS, MG -----

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.20
SP.GRAVITY, HYDROM. = 1.0580

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.410885
HYDROGEN	0.525124
OXYGEN	1.400863
NITROGEN	5.107719
SULFUR	0.007791

FEED RATE, #/SEC= 1.60

ENTHALPY, BTU/# = 1708.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-100	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST,H20	0.8000E 01	N.G. FLOW,ZSCALE	0.9800E 02
TIME	1310	BURNER DP,H20	0.6000E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H20	0.4200E 01	SCREW SPEED,RPM	0.3150E 03
PRI.AIR DP,H20	0.2100E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX,%-BM	0.6000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H20	0.5000E 01	COMB.FURN.EX,%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX.ST,H20	0.4000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2868E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1000E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	0.5650E 03
ABS NOZ.,PSIG	0.1750E 02	WINDBOX-TOP	0.6350E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.1300E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.8950E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7850E 03	PRI.AIR FAN IN.	0.8800E 02
		NO.2 BANK OUT	0.6600E 03	PRI.AIR WGT BULB	0.6900E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.3700E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	0.3200E 02
PART.SCR.ST,HG	0.1500E 00				
PART.SCR.DP,H20	0.6400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H20	0.5400E 01	VENT.ABS.DP,H20	0.9000E 00	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.9000E 00	ABS CYC.DP,H20	0.4600E 01	FBA SUMP DP,H20	0.0
#1 ORIF.DP,H20	0.4200E 01			FBA DP,H20	0.0
				FBA DEMIST.DP,H20	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1340E 03	TEMP.THERMOMETERS,F	0.1375E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.8545E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1370E 03	PART.FINAL,GAL	0.8598E 05
FBA EXIT	0.0	PART.CYC.SUMP	0.1370E 03	PART.TIME,MIN	0.1000E 03
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1692E 05
PART.CYC.SUMP	0.1310E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.1699E 05
ABS CYC.SUMP	0.9000E 02	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.1000E 03
FBA SUMP	0.0	MGOH2 TANK	0.8200E 02	MGO ROTO.SCALE,%	0.4500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.4500E 02
MGOH2 TANK	0.8000E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER H-100		DATE 3-24-70		TIME OF DAY 1310			
FLUE GAS DATA		FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF
PRIMARY AIR	466.	110.0	---	---	---	---	---
SECONDARY AIR	4884.	641.3	---	---	---	---	---
FURNACE EXIT	5713.	660.0	4507.4	32.0	*****	*****	*****
PART.SCRB.INLET	5713.	565.0	*****	*****	*****	*****	*****
PART.CYC.EXIT	5508.	137.5	3625.7	*****	*****	*****	*****
VENT ABS.INLET	5508.	137.5	*****	*****	*****	*****	*****
ABS CYC.EXIT	5972.	137.0	*****	*****	*****	*****	*****
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	5972.	132.0	1222.6	*****	*****	*****	*****
			</				

SCRUBBER STREAM DATA		VENTURI ABSORBER		FBA	
PARTICULATE	TEMP,F	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
MAKEUP WATER	60.0	60.0	5.8	*****	*****
PRODUCT LIQ.	137.0	80.0	5.2	*****	*****
RECIRCULATED LIQ.	137.0	137.0	20.2	*****	*****
		REC.(SPRAY NOZ)	463.0	*****	*****
		REC.(FLOW NOZ.)	237.2	*****	*****

FURNACE PERFORMANCE		SCRUBBER PERFORMANCE		VENT ABS.		FLOAT.BED	
HEAT RELEASE,BTU/HR	0.482E 07	SO2 ABSORB.EFF	19.56	66.28	*****	*****	*****
% FUEL AS COAL	96.0	FLYASH COL.EFF	*****	*****	*****	*****	*****
COAL FLOW RATE,#/HR	380.3	SO3 ABSORB.EFF	*****	*****	*****	*****	*****
NAT.GAS FLOW,#/HR	8.8	NOX ABSORB.EFF	*****	79.9	*****	*****	*****
% EXCESS AIR	28.6	GAS VELOCITY,FPS	152.8	16.9	*****	*****	*****
OXYGEN,%DRY,MEAS.	6.00	LIQ/GAS,GAL/MCF	15.3	2.4	*****	*****	*****
CO2,%DRY-CALC.	12.86	LIQ/GAS,#/#	2.1	0.9	*****	*****	*****
HUMIDITY,#/# - CALC.	0.041	PRES.DROP,IN.WG	6.4		*****	*****	*****

SO2 ABSORPTION PARAMETERS		VENTURI ABSORBER		FLOATING BED ABSORBER	
KGA,#MOLE/HR-FT2,	= 72.4	KGA,#MOLE/HR-FT2	=	KGA,#MOLE/HR-FT2	=
SULFITE/SO2-MOL/MOL	= *****	SULFITE/SO2-MOL/MOL	=	SULFITE/SO2-MOL/MOL	=
SUMP RESID.TIME,MIN	= 6.5	SUMP RESID.TIME,MIN	=	SUMP RESID.TIME,MIN	=
***** MEANS ITEM NOT MEASURED					

SULFATE FORMATION PARAMETERS	
CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	*****
O2 AT FURN.EX.=	6.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

STAT PRES IN.H2O	16.3
DRY FLOW #/HR	460.
DEW POINT F	66.7
HUM.#/#	0.012
FLYASH GR/DSCF	---
NOX PPM	---
SO2 PPM	---
SO3 PPM	---
TEMP.F	110.0
FLOW #/HR	466.
PRIMARY AIR	466.
SECONDARY AIR	4884.
FURNACE EXIT	5713.
PART.SCRB.INLET	5713.
PART.CYC.EXIT	5508.
VENT ABS.INLET	5508.
ABS CYC.EXIT	5972.
FLOATING BED IN	*****
FLOATING BED EX	*****
P.P. EXIT ORIF.	5972.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-100 DATE 3-24-70 TIME OF DAY 1310

MATERIAL BALANCES

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
FURNACE					INPUT FLOWS,#ATOMS/100#FEED
INPUT,#/HR	14.07	28.14	204.5	5483.	CARBON 0.405836
OUTPUT,#/HR	26.06	*****	223.5	5489.	HYDROGEN 0.516664
					OXYGEN 1.401445
PART.SCRUBBER					NITROGEN 5.112370
INPUT,#/HR	26.06	*****	2884.	5489.	SULFUR 0.007691
OUTPUT,#/HR	18.97	*****	3089.	4967.	
					FEED RATE,#/SEC= 1.59
SO2 ABSORBERS					ENTHALPY,BTU/# = 2228.
INPUT,#/HR	18.97	*****	1196.	4967.	
OUTPUT,#/HR	23.94	*****	1695.	5488.	

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	2.78	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	2.78	100ML	SLURRY CONC.- GM MGO/100ML = *****
FREE	0.0		MGO PRESLAKED, NO=0, YES=1 0
MONO(TOTAL)	2.78		% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	*****		
MONO(SOLID)	*****		
BISULFITE	*****		
MGQ	0.30		
SULFATE	*****		
MAGNESIUM	3.08		
FLYASH	----		
SOLIDS, MG	----		

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	= 6.50
SP.GRAVITY, HYDROM.	= 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	= *****
FLYASH CONC. GM/100ML	= *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	H-101	CARD NUMBER	2	CARD NUMBER	3
DATE	3-24-70	WINDBOX ST,H2O	0.8000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1445	BURNER DP,H2O	0.5400E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.4500E 01	SCREW SPEED,RPM	0.3150E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1800E 01	D2 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.3000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2868E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1050E 03	TEMP.CONTINUED	0.5800E 03
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6550E 03	PART.SCRUB.IN	0.1500E 03
ABS NOZ.,PSIG	0.1600E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.0
ABS LOAD,PSIG	0.5100E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.7000E 03
ABS ORIF.INCH	0.1100E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.9100E 03	AIR HEATER #2	0.8700E 02
MANGMETER CODE	0	NO.1 BANK OUT	0.8050E 03	PRI.AIR FAN IN.	0.6300E 02
		NO.2 BANK OUT	0.6700E 03	PRI.AIR WGT BULB	0.3600E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.3200E 02
MODE OF OPER.	2	COAL-AIR		SEC.AIR WET BULB	
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6600E 01				
PART.CYC.DP,H2O	0.5400E 01				
#1 ORIF.ST,HG	-0.9000E 00				
#1 ORIF.DP,H2O	0.4300E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.8000E 00	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.4600E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1340E 03	TEMP.THERMOMETERS,F	0.1380E 03	MAKEUP FLOWS	0.8598E 05
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.8648E 05
FBA INLET	0.0	ABS CYC.EXIT	0.1370E 03	PART.FINAL,GAL	0.9000E 02
FBA EXIT	0.1310E 03	PART.CYC.SUMP	0.1360E 03	PART.TIME,MIN	0.1699E 05
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.1702E 05
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.9000E 02
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.7600E 02	ABS H2O TIME,MIN	0.4500E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO.SCALE,3	0.4500E 02
MGO SLAK TANK	0.7600E 02			MAKEUP SETTING	0.4500E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER H-101

DATE 3-24-70

TIME OF DAY 1445

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN-H2O
PRIMARY AIR	477.	110.0	---	---	---	---	0.008	55.2	474.	16.3
SECONDARY AIR	4862.	636.3	---	---	---	---	0.004	33.4	4845.	8.0
FURNACE EXIT	5707.	670.0	4945.9	---	---	---	0.041	104.8	5482.	3.0
PART.SCRB.INLET	5707.	580.0	---	---	---	---	0.041	104.8	---	2.7
PART.CYC.EXIT	5566.	138.0	3743.9	---	---	---	0.113	136.0	4999.	-12.2
VENT ABS.INLET	5566.	138.0	---	---	---	---	0.113	136.0	---	-16.5
ABS CYC.EXIT	5845.	137.0	---	---	---	---	0.096	129.5	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	5845.	131.0	1315.0	*****	*****	*****	0.096	129.5	5334.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	5.50	---	60.0 3.1	*****
MAKEUP WATER	137.0	5.09	MAKEUP MGO SL.	76.0 5.2	*****
PRODUCT LIQ.	137.0	23.15	PRODUCT LIQ.	136.0 16.9	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	136.0 436.5	*****
			REC.(FLOW NOZ.)	218.2	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.488E 07
% FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	384.7
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	27.6
OXYGEN,% DRY, MEAS.	5.80
CO2,% DRY-CALC.	13.04
HUMIDITY,#/# - CALC.	0.041

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	24.30
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	154.8
LIQ/GAS,GAL/MCF	15.1
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.6

FLOAT.BED

VENT ABS.	64.88
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FT2, = 67.7
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = 7.8

KGA,#MOLE/HR-FT2 = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

CONC.,GM-MOLE/L= 0.0724
 MOL% TOTAL SULF= 7.72
 O2 AT FURN.EX.= 5.80
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER H-101

DATE 3-24-70

TIME OF DAY 1445

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.410843
 HYDROGEN 0.479870
 OXYGEN 1.400859
 NITROGEN 5.107760
 SULFUR 0.007788

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 2035.

SULFUR FLYASH WATER DRY GAS

14.24 28.47 205.9 5476.
 28.53 ***** 224.9 5482.

PART.SCRUBBER
 INPUT, #/HR 28.53 ***** 2976. 5482.
 OUTPUT, #/HR 19.70 ***** 3115. 4999.

S02 ABSORBERS
 INPUT, #/HR 19.70 ***** 1062. 4999.
 OUTPUT, #/HR 37.86 ***** 1511. 5334.

*S02 ABSORBERS-
 PRODUCT COMP. GRAM/ 100ML

TOTAL, 5.54
 COMBINED 5.54
 FREE 0.0
 MONO(TOTAL) 5.54
 MONO(DISSOLVED) *****
 MONO(SOLID) *****
 BISULFITE *****
 MGO 0.86
 SULFATE 0.46
 MAGNESIUM 6.86
 FLYASH
 SOLIDS, MG

MAKEUP MGO COMPOSITION
 SLURRY CONC.- GM MGO/100ML = *****
 MGO PRESLAKED, NO=0, YES=1 0
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = *****
 SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-102	CARD NUMBER	3
DATE	3-31-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	1200	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1400E 01	SCREW SPEED, RPM	0.3500E 03
PRI. AIR DP, H2O	0.2400E 01	O2 FURN. EX. % - BM	0.5900E 01
SEC. AIR ST, HG	0.1500E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2900E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.1050E 03	PART. SCRUB. IN	0.5800E 03
ABS NOZ., PSIG	0.1900E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.4100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.8800E 03	PRI. AIR FAN IN.	0.7500E 02
		NO. 2 BANK OUT	0.7800E 03	PRI. AIR WGT BULB	0.5500E 02
		FURN. EXIT	0.6200E 03	SEC. AIR FAN IN.	0.4700E 02
		COAL-AIR	0.1100E 03	SEC. AIR WET BULB	0.4700E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	2	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
PART. SCR. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.4800E 01	FBA SUMP DP, H2O	0.0
PART. SCR. DP, H2O	0.6000E 01			FBA DP, H2O	0.0
PART. CYC. DP, H2O	0.5800E 01			FBA DEMIST. DP, H2O	0.0
#1 ORIF. ST, HG	-0.9000E 00				
#1 ORIF. DP, H2O	0.4400E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1360E 03	PART. CYC. EXIT	0.1350E 03	PART. INIT. GAL	0.9241E 04
FBA INLET	0.0	ABS CYC. EXIT	0.1360E 03	PART. FINAL, GAL	0.9567E 04
FBA EXIT	0.0	PART. CYC. SUMP	0.1360E 03	PART. TIME, MIN	0.6000E 02
P.P. EXIT	0.1310E 03	ABS CYC. SUMP	0.1350E 03	ABS H2O IN. GAL	0.7754E 04
PART. CYC. SUMP	0.1310E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.7805E 04
ABS CYC. SUMP	0.1310E 03	MGO SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.1340E 03	MGO ROTO. SCALE, %	0.3300E 02
MGO SLAK TANK	0.1800E 03			MAKEUP SETTING	0.3300E 02
MGOH2 TANK	0.1300E 03				
MAKEUP WATER	0.6000E 02				

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	503.	110.0	---	---	---	---	0.006	45.4	500.	19.0
SECONDARY AIR	4890.	642.5	---	---	---	---	0.008	54.1	4853.	6.5
FURNACE EXIT	5761.	620.0	3136.1	*****	*****	*****	0.044	107.5	5517.	3.0
PART.SCRB.INLET	5761.	580.0	*****	*****	*****	*****	0.044	107.5	---	1.4
PART.CYC.EXIT	5669.	135.0	2676.4	*****	*****	*****	0.118	137.7	5072.	-12.2
VENT ABS.INLET	5669.	135.0	*****	*****	*****	*****	0.118	137.7	---	-16.6
ABS CYC.EXIT	5959.	136.0	*****	*****	*****	*****	0.108	133.4	---	-27.1
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5959.	131.0	513.2	*****	*****	*****	0.108	133.4	5378.	-27.1

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FBA	
PARTICULATE	TEMP, F	GAS ABSORBER	TEMP, F	TEMP, F	FLOW, #/M
MAKEUP WATER	60.0	MAKEUP WATER	60.0	7.1	*****
PRODUCT LIQ.	136.0	MAKEUP MGO SL.	130.0	4.3	*****
RECIRCULATED LIQ.	136.0	PRODUCT LIQ.	135.0	14.3	*****
		REC. (SPRAY NOZ)	135.0	488.0	*****
		REC. (FLOW NOZ.)		455.7	*****

FURNACE PERFORMANCE

RANCE PERFORMANCE
 HEAT RELEASE, BTU/HR
 & FUEL AS COAL
 COAL FLOW RATE, #/HR
 NAT. GAS FLOW, #/HR
 & EXCESS AIR
 OXYGEN, % DRY, MEAS.
 CO₂, % DRY-CALC.
 HUMIDITY, #/# - CALC.

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT ² ,	=	107.8
SULFITE/SO ₂ -MOL/MOL	=	9.39
SUMP RESID.TIME, MIN	=	9.2

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KG, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L =	0.0341
MOL % TOTAL SULF =	4.67
02 AT FURN. EX =	5.90
02 AT ABSORB. IN =	*****
02 AT ABSORB. EX =	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-102 DATE 3-31-70 TIME OF DAY 1200

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.23	---	28.47	224.4	5511.
OUTPUT, #/HR	18.21	---	*****	243.5	5517.
PART. SCRUBBER					
INPUT, #/HR	18.21	---	*****	2960.	5517.
OUTPUT, #/HR	14.29	---	*****	3146.	5072.
SO2 ABSORBERS					
INPUT, #/HR	14.29	*****	*****	1281.	5072.
OUTPUT, #/HR	24.50	17.88	*****	1364.	5378.

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.408344
HYDROGEN	0.451575
OXYGEN	1.401154
NITROGEN	5.110061
SULFUR	0.007740

FEED RATE, #/SEC= 1.60

ENTHALPY, BTU/# = 438.

* SO2 ABSORBERS-PRODUCT COMP.

	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
TOTAL,	4.81	0.7521	---
COMBINED	4.81	0.7521	---
FREE	0.0	0.0	---
MONO(TOTAL)	4.81	0.7521	---
MONO(DISSOLVED)	1.04	0.1625	1.690
MONO(SOLID)	3.77	0.5896	12.499
BISULFITE	0.0	0.0	0.0
MGO	0.52	0.0806	0.322
SULFATE	0.22	0.0341	0.410
MAGNESIUM	5.55	0.8668	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	12.962

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****

MGO PRESLAKED, NO=0, YES=1 = 1

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 8.50

SP.GRAVITY, HYDROM. = 1.0350

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-103	CARD NUMBER	2	CARD NUMBER	3
DATE	3-31-70	WINDBOX ST,H20	0.7000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1330	BURNER DP,H20	0.5500E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H20	0.2000E 01	SCREW SPEED,RPM	0.3250E 03
PRI.AIR DP,H20	0.2500E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.6000E 01
SEC.AIR ST,HG	0.1200E 01	PP EXIT DP,H20	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H20	0.2300E 01	FURN.EX-ST,H20	0.3000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2902E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1150E 03	PART.SCRUB.IN	0.5850E 03
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6350E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.6350E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9000E 03	PRI.AIR FAN IN.	0.7900E 02
		NO.2 BANK OUT	0.8000E 03	PRI.AIR WGT BULB	0.5800E 02
CARD NUMBER	7	FURN. EXIT	0.6300E 03	SEC.AIR FAN IN.	0.5100E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4500E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H20	0.6200E 01				
PART.CYC.DP,H20	0.5400E 01				
#1 ORIF.ST,HG	-0.8000E 00				
#1 ORIF.DP,H20	0.4400E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H20	0.1500E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H20	0.4800E 01	FBA SUMP DP,H20	0.0
		FBA DP,H20	0.0
		FBA DEMIST.DP,H20	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1360E 03	PART.CYC.EXIT	0.1360E 03	PART.INIT.GAL	0.9567E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1360E 03	PART.FINAL,GAL	0.9900E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1370E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.1350E 03	ABS H20 IN.GAL	0.7805E 04
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.0	ABS H20 FI.GAL	0.7870E 04
ABS CYC.SUMP	0.1310E 03	MGO SLAK TANK	0.2000E 03	ABS H20 TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.1290E 03	MGO ROTO.SCALE,%	0.3200E 02
MGO SLAK TANK	0.1990E 03			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.1260E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-103

DATE 3-31-70

TIME OF DAY 1330

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	512.	110.0	-----	-----	-----	-----	0.006	49.5	509.	16.3
SECONDARY AIR	4828.	645.0	-----	-----	-----	-----	0.006	46.5	4800.	7.0
FURNACE EXIT	5701.	630.0	3135.1	-----	-----	-----	0.042	106.3	5469.	3.0
PART.SCRB.INLET	5701.	585.0	-----	-----	-----	-----	0.042	106.3	-----	1.4
PART.CYC.EXIT	5677.	136.0	2675.5	-----	-----	-----	0.117	137.6	5084.	-10.8
VENT ABS.INLET	5677.	136.0	-----	-----	-----	-----	0.117	137.6	-----	-15.2
ABS CYC.EXIT	5977.	136.0	-----	-----	-----	-----	0.108	133.5	-----	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5977.	130.0	513.0	*****	*****	*****	0.108	133.5	5396.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.55	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	137.0	5.09	MAKEUP MGO SL.	9.0	*****
PRODUCT LIQ.	137.0	23.15	PRODUCT LIQ.	4.2	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	14.6	*****
			REC.(FLOW NOZ.)	488.0	*****
				455.7	*****

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,%DRY,MEAS.	CO2,%DRY-CALC.	HUMIDITY,#/# - CALC.	SCRUBBER PERFORMANCE	PART.	VENT ABS.	VENTURI ABSORBER	FBA
	0.481E 07	95.9	378.7	8.9	28.6	6.00	12.86	0.042	SO2 ABSORB.EFF	14.66	80.82	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
									FLYASH COL.EFF	*****	*****	9.0	*****
									SO3 ABSORB.EFF	*****	*****	4.2	*****
									NOX ABSORB.EFF	*****	*****	14.6	*****
									GAS VELOCITY,FPS	155.3	80.0	488.0	*****
									LIQ/GAS,GAL/MCF	15.0	32.5	455.7	*****
									LIQ/GAS,#/#	2.0	4.6		*****
									PRES.DROP,IN.WG	6.2	1.5		*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 108.2
SULFITE/SO2-MOL/MOL = 6.30
SUMP RESID.TIME,MIN = 9.0

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = *****
SULFITE/SO2-MOL/MOL = *****
SUMP RESID.TIME,MIN = *****

CONC.,GM-MOLE/L= 0.0168
MOL% TOTAL SULF= 2.66
O2 AT FURN.EX.= 6.00
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-103

DATE 3-31-70

TIME OF DAY 1330

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR 14.01 18.06

MAGNESIUM 28.03

WATER 213.2 232.3

FLYASH 5463. 5469.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

18.06 14.33

3008. 3142.

5469. 5084.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

14.33 21.83

1359. 1386.

5084. 5396.

*

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 9.50

MGO PRESLAKED, NO=0, YES=1

% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

4.21 4.21 0.0 4.21 0.70 3.51 0.32 0.38 0.11 4.71
0.6585 0.6585 0.0 0.6585 0.1094 0.5492 0.0250 0.0600 0.0168 0.7354
1.137 11.642 0.465 0.240 0.202

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	1-104	CARD NUMBER	2	CARD NUMBER	3
DATE	3-31-70	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1500	BURNER DP,H2O	0.5500E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1400E 01	FURN. ST,H2O	0.3500E 01	SCREW SPEED,RPM	0.3250E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.6000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.2500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2910E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1150E 03	PART.SCRUB.IN	0.5900E 03
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4700E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9100E 03	PRI.AIR FAN IN.	0.8200E 02
		NO.2 BANK OUT	0.8000E 03	PRI.AIR WGT BULB	0.5900E 02
CARD NUMBER	7	FURN. EXIT	0.6400E 03	SEC.AIR FAN IN.	0.5200E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4400E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.6500E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5400E 01	VENT.ABS.DP,H2O	0.1800E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1360E 03	PART.CYC.EXIT	0.1360E 03	PART.INIT.GAL	0.8900E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1370E 03	PART.FINAL,GAL	0.9414E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1380E 03	PART.TIME,MIN	0.9500E 02
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.1360E 03	ABS H2O IN.GAL	0.7870E 04
PART.CYC.SUMP	0.1320E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.7965E 04
ABS CYC.SUMP	0.1310E 03	MGO SLAK TANK	0.1920E 03	ABS H2O TIME,MIN	0.9500E 02
FBA SUMP	0.0	MGOH2 TANK	0.1250E 03	MGO ROTO.SCALE,%	0.3300E 02
MGO SLAK TANK	0.1890E 03			MAKEUP SETTING	0.3300E 02
MGOH2 TANK	0.1220E 03				
MAKEUP WATER	0.6000E 02				

RUN NUMBER I-104

DATE 3-31-70

TIME OF DAY 1500

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	483.	110.0	---	---	---	---	0.006	49.2	479.	19.0
SECONDARY AIR	4744.	642.5	---	---	---	---	0.005	43.4	4720.	7.0
FURNACE EXIT	5581.	640.0	3105.5	---	---	---	0.042	105.9	5355.	2.5
PART.SCRB.INLET	5581.	590.0	---	---	---	---	0.042	105.9	---	1.4
PART.CYC.EXIT	5687.	136.0	2595.6	---	---	---	0.115	137.3	5099.	-10.8
VENT ABS.INLET	5687.	136.0	---	---	---	---	0.115	137.3	---	-15.2
ABS CYC.EXIT	5990.	137.0	---	---	---	---	0.106	133.1	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5990.	132.0	539.0	---	---	---	0.106	133.1	5417.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.41	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	138.0	5.09	MAKEUP MGO SL.	8.3	*****
RECIRCULATED LIQ.	138.0	23.15	PRODUCT LIQ.	4.3	*****
			REC.(SPRAY NOZ)	14.6	*****
			REC.(FLOW NOZ.)	488.0	*****
				450.9	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.471E 07
% FUEL AS COAL	95.8
COAL FLOW RATE,#/HR	370.7
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	28.6
OXYGEN,%DRY,MEAS.	6.00
CO2,%DRY-CALC.	12.86
HUMIDITY,#/# - CALC.	0.042

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	16.42
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	155.0
LIQ/GAS,GAL/MCF	15.1
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.5

VENT ABS.

79.23	*****
*****	*****
*****	*****
*****	*****
79.7	*****
32.3	*****
4.5	*****
1.8	*****

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	103.4
SULFITE/SO2-MOL/MOL	=	9.69
SUMP RESID.TIME,MIN	=	9.0

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0208
MOL% TOTAL SULF=	2.70
O2 AT FURN.EX.=	6.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-104

DATE 3-31-70

TIME OF DAY 1500

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	13.71	---	---	27.43	205.3	5351.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	17.52	---	---	*****	224.5	5356.	CARBON . 0.405659
							HYDROGEN 0.458444
PART. SCRUBBER							OXYGEN 1.401430
INPUT, #/HR	17.52	---	---	*****	2933.	5356.	NITROGEN 5.112542
OUTPUT, #/HR	13.94	---	---	*****	3137.	5099.	SULFUR 0.007682
							FEED RATE, #/SEC= 1.55
SO2 ABSORBERS							ENTHALPY, BTU/# = 1605.
INPUT, #/HR	13.94	*****	*****	*****	1345.	5099.	
OUTPUT, #/HR	25.72	17.56	*****	*****	1359.	5417.	

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*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	5.04	GM SO2/	GRAM/	MAKEUP MGD COMPOSITION
COMBINED	5.04	100ML	100ML	SLURRY CONC.- GM MGD/100ML = *****
FREE	0.0			MGO PRESLAKED, NO=0, YES=1 *****
MONO(TOTAL)	5.04	GM-MOLE/		% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	1.06	LITER		
MONO(SOLID)	3.98			
BISULFITE	0.12			
MGO	0.17			
SULFATE	0.13			
MAGNESIUM	5.34			
FLYASH	---			
SOLIDS, MG	---			

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

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*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-105	CARD NUMBER	2
DATE	3-31-70	WINDBOX ST, H2O	0.7500E 01
TIME	1630	BURNER DP, H2O	0.5500E 01
PRI. AIR ST, HG	0.1400E 01	FURN. ST, H2O	0.3600E 01
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1900E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5000E 01
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.4000E 01
		PEEPSITE DP, HG	0.0
		P. SITE ST, PSIG	0.0

CARD NUMBER	4	CARD NUMBER	5
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1050E 03
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.6600E 03
ABS NOZ., PSIG	0.1900E 02	WINDBOX-TOP	0.6500E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-WEST	0.6500E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.6550E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.9200E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.8150E 03
		NO. 2 BANK OUT	0.6400E 03
		FURN. EXIT	0.1100E 03
		COAL-AIR	

CARD NUMBER	7	CARD NUMBER	8
MODE OF OPER.	2	VENT. ABS. DP, H2O	0.1800E 01
PART. SCR. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.5000E 01
PART. SCR. DP, H2O	0.6000E 01		
PART. CYC. DP, H2O	0.5400E 01		
#1 ORIF. ST, HG	-0.9000E 00		
#1 ORIF. DP, H2O	0.4200E 01		

CARD NUMBER	10	CARD NUMBER	11
TEMP. PILOT RECORDER, F	0.1360E 03	TEMP. THERMOMETERS, F	0.1360E 03
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1360E 03
FBA INLET	0.0	ABS CYC. EXIT	0.1380E 03
FBA EXIT	0.0	PART. CYC. SUMP	0.1350E 03
P. P. EXIT	0.1320E 03	ABS CYC. SUMP	0.0
PART. CYC. SUMP	0.1330E 03	FBA SUMP	0.1790E 03
ABS CYC. SUMP	0.1320E 03	MGO SLAK TANK	0.1200E 03
FBA SUMP	0.0	MGOH2 TANK	
MGO SLAK TANK	0.1780E 03		
MGOH2 TANK	0.1180E 03		
MAKEUP WATER	0.6000E 02		

CARD NUMBER	6	CARD NUMBER	9
TEMP. CONTINUED		FBA INLET ST, HG	0.0
PART. SCRUB. IN	0.6000E 03	FBA SUMP DP, H2O	0.0
#1 ORIFICE	0.1500E 03	FBA DP, H2O	0.0
FBA INLET	0.0	FBA DEMIST. DP, H2O	0.0
AIR HEATER #1	0.7000E 03		
AIR HEATER #2	0.7000E 03		
PRI. AIR FAN IN.	0.7800E 02		
PRI. AIR WGT BULB	0.5700E 02		
SEC. AIR FAN IN.	0.4800E 02		
SEC. AIR WET BULB	0.4100E 02		

CARD NUMBER	12
MAKEUP FLOWS	
PART. INIT. GAL	0.1414E 04
PART. FINAL, GAL	0.1782E 04
PART. TIME, MIN	0.7000E 02
ABS H2O IN. GAL	0.7965E 04
ABS H2O FI. GAL	0.8035E 04
ABS H2O TIME, MIN	0.7040E 02
MGO ROTO. SCALE, %	0.3300E 02
MAKEUP SETTING	0.3300E 02

RUN NUMBER I-105

DATE 3-31-70

TIME OF DAY 1630

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	504.	110.0					0.006	47.7	501.	19.0
SECONDARY AIR	4783.	653.8					0.005	40.7	4761.	7.5
FURNACE EXIT	5647.	640.0	3109.7				0.042	105.8	5422.	4.0
PART.SCRB.INLET	5647.	600.0					0.042	105.8		1.4
PART.CYC.EXIT	5540.	136.0	2599.1				0.117	137.6	4960.	-12.2
VENT ABS.INLET	5540.	136.0					0.117	137.6		-16.4
ABS CYC.EXIT	5973.	136.0					0.106	133.2		-25.7
FLOATING BED IN	*****	*****					*****	*****		*****
FLOATING BED EX	*****	*****					*****	*****		*****
P.P. EXIT ORIF.	5973.	132.0	539.8				0.106	133.2	5398.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.26	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	138.0	5.09	MAKEUP MGO SL.	60.0 8.2	*****
RECIRCULATED LIQ.	138.0	23.15	PRODUCT LIQ.	118.0 4.3	*****
			REC.(SPRAY NDZ)	135.0 15.0	*****
			REC.(FLOW NDZ.)	488.0	*****
				455.7	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.479E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
% FUEL AS COAL	95.9	SU2 ABSORB.EFF	16.42	79.23	*****
COAL FLOW RATE,#/HR	377.8	FLYASH COL.EFF	*****	*****	*****
NAT.GAS FLOW,#/HR	8.9	SO3 ABSORB.EFF	*****	*****	*****
% EXCESS AIR	28.1	NOX ABSORB.EFF	*****	*****	*****
OXYGEN,% DRY, MEAS.	5.90	GAS VELOCITY,FPS	151.9	79.8	*****
CO2,% DRY-CALC.	12.95	LIQ/GAS,GAL/MCF	15.4	32.6	*****
HUMIDITY,#/# - CALC.	0.042	LIQ/GAS,#/#	2.1	4.6	*****
		PRES.DROP,IN.WG	6.0	1.8	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 103.0
SULFITE/SO2-MOL/MOL = 9.82
SUMP RESID.TIME,MIN = 8.8

FLOATING BED ABSORBER

= *****
= *****
= *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0180
MOL% TOTAL SULF= 2.35
O2 AT FURN.EX.= 5.90
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	I-105	DATE	3-31-70	TIME OF DAY	1630
MATERIAL BALANCES					
FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER
INPUT, #/HR	13.98			27.96	206.6
OUTPUT, #/HR	17.75			*****	5416.
PART. SCRUBBER					5422.
INPUT, #/HR	17.75			*****	
OUTPUT, #/HR	13.57			*****	5422.
SO2 ABSORBERS					4960.
INPUT, #/HR	13.57			*****	
OUTPUT, #/HR	26.87			*****	4960.

*SO2 ABSORBERS-PRODUCT COMP.	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML
TOTAL, COMBINED	5.17	0.8084	---
FREE	5.17	0.8084	---
MONO(TOTAL)	0.0	0.0	---
MONO(DISSOLVED)	5.17	0.8084	---
MONO(SOLID)	1.06	0.1656	1.722
BISULFITE	4.11	0.6428	13.627
MGO	0.12	0.0094	0.174
SULFATE	0.19	0.0303	0.121
MAGNESIUM	0.12	0.0180	0.216
FLYASH	5.48	0.8567	---
SOLIDS, MG	---	---	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.408242
 HYDROGEN 0.457009
 OXYGEN 1.401144
 NITROGEN 5.110161
 SULFUR 0.007735

FEED RATE, #/SEC = 1.57

ENTHALPY, BTU/# = 2012.

MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML = *****
 MGO PRESLAKED, NO=0, YES=1 1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = *****
 SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	I-106 3-31-70 1800	CARD NUMBER	2	CARD NUMBER	3
PRI-AIR ST, HG	0.1300E 01	WINDBOX ST,H2O	0.9200E 01	N.G. FLOW,%SCALE	0.9450E 02
PRI-AIR DP,H2O	0.2500E 01	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8300E 01
SEC-AIR ST,HG	0.1500E 01	FURN. ST,H2O	0.4100E 01	SCREW SPEED,RPM	0.3300E 03
SEC-AIR DP,H2O	0.2250E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN-EX,%-BM	0.6400E 01
		PP EXIT DP,H2O	0.5000E 01	COMB-FURN,EX,%	0.0
		FURN-EX,ST,H2O	0.3500E 01	ELE-CHEM,MILVOLT	0.5600E 01
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.1175E 04
		P-SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2907E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC-AIR ORIF.	0.1030E 03	PART.SCRUB-IN	
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.6100E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6280E 03	FBA INLET	0.1500E 03
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6280E 03	AIR HEATER #1	0.0
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6420E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9250E 03	PRI-AIR FAN IN.	0.7700E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8200E 03	PRI-AIR WGT BULB	0.5600E 02
MODE OF OPER.	2	FURN. EXIT	0.6550E 03	SEC-AIR FAN IN.	0.3400E 02
PART-SCR.ST,HG	0.1000E 00	COAL-AIR	0.1250E 03	SEC-AIR WET BULB	0.3400E 02
PART-SCR.DP,H2O	0.6100E 01	CARD NUMBER	8	CARD NUMBER	9
PART-CYC.DP,H2O	0.5600E 01	VENT.ABS-DP,H2O	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7000E 00	ABS CYC-DP,H2O	0.5000E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST-DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1360E 03	PART.CYC.EXIT	0.1360E 03	PART.INIT.GAL	0.1239E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1360E 03	PART.FINAL,GAL	0.1649E 04
FBA EXIT	0.0	PART.CYC-SUMP	0.1380E 03	PART.TIME,MIN	0.6228E 02
P.P.EXIT	0.1320E 03	ABS CYC-SUMP	0.1340E 03	ABS H2O IN.GAL	0.8106E 04
PART-CYC-SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.8195E 04
ABS CYC-SUMP	0.1340E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6228E 02
FBA SUMP	0.0	MGOH2 TANK	0.1360E 03	MGO ROTO.SCALE,%	0.3100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.3100E 02
MGOH2 TANK	0.1340E 03				
MAKEUP WATER	0.6100E 02				

RUN NUMBER I-106

DATE 3-31-70

TIME OF DAY 1800

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	507.	125.0	---	---	---	---	0.006	46.1	504.	17.6
SECONDARY AIR	4855.	638.3	---	---	---	---	0.005	40.9	4832.	9.2
FURNACE EXIT	5716.	655.0	3112.9	---	---	---	0.040	104.8	5494.	3.5
PART.SCRB.INLET	5716.	610.0	-----	-----	-----	-----	0.040	104.8	-----	1.4
PART.CYC.EXIT	5677.	136.0	2601.7	-----	-----	-----	0.125	139.9	5046.	-9.5
VENT ABS.INLET	5677.	136.0	-----	-----	-----	-----	0.125	139.9	-----	-13.9
ABS CYC.EXIT	5956.	136.0	-----	-----	-----	-----	0.116	135.9	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	5956.	132.0	540.3	-----	-----	-----	0.116	135.9	5338.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	61.0	6.58	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	138.0	5.09	MAKEUP MGO SL.	11.9	-----
RECIRCULATED LIQ.	138.0	23.15	PRODUCT LIQ.	4.1	-----
			REC.(SPRAY NOZ)	16.3	-----
			REC.(FLOW NOZ.)	488.0	-----
				436.3	-----

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	SO2 ABSORB.EFF	PART.	VENT ABS.	FLOAT.BED
% FUEL AS COAL	0.470E 07	96.0	16.42	79.23	-----
COAL FLOW RATE,#/HR	371.0	---	-----	-----	-----
NAT.GAS FLOW,#/HR	8.6	---	-----	-----	-----
% EXCESS AIR	30.5	---	-----	-----	-----
OXYGEN, % DRY, MEAS.	6.40	---	155.3	80.0	-----
CO2, % DRY-CALC.	12.52	---	15.0	31.1	-----
HUMIDITY, #/# - CALC.	0.040	---	2.0	4.4	-----
		---	6.1	1.7	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

	KGA,#MOLE/HR-FT2,	=	102.0	KGA,#MOLE/HR-FT2	=	-----
	SULFITE/SO2-MOL/MOL	=	9.66	SULFITE/SO2-MOL/MOL	=	-----
	SUMP RESID.TIME,MIN	=	9.1	SUMP RESID.TIME,MIN	=	-----
**** MEANS ITEM NOT MEASURED						

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0194
MOL% TOTAL SULF=	3.49
O2 AT FURN.EX.=	6.40
O2 AT ABSORB.IN=	-----
O2 AT ABSORB.EX=	-----

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-106

DATE 3-31-70

TIME OF DAY 1800

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	13.73			27.45	203.6	5488.	
OUTPUT, #/HR	18.03			*****	222.0	5494.	
PART. SCRUBBER							
INPUT, #/HR	18.03			*****	3513.	5494.	
OUTPUT, #/HR	13.84			*****	3180.	5046.	
SO2 ABSORBERS							
INPUT, #/HR	13.84		13.21	*****	1570.	5046.	
OUTPUT, #/HR	21.28		15.55	*****	1533.	5338.	

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.395932
 HYDROGEN 0.441362
 OXYGEN 1.402635
 NITROGEN 5.121480
 SULFUR 0.007504

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 2016.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/
COMBINED	100ML	LITER	100ML
FREE	3.60	0.5632	-----
MONO(TOTAL)	3.60	0.5632	-----
MONO(DISSOLVED)	0.0	0.0	-----
MONO(SOLID)	3.60	0.5632	-----
BISULFITE	1.08	0.1687	1.755
MGO	2.52	0.3944	8.362
SULFATE	0.0	0.0	0.0
MAGNESIUM	0.50	0.0786	0.314
FLYASH	0.12	0.0194	0.233
SOLIDS, MG	4.23	0.6611	-----
	-----	-----	*****
	-----	-----	*****

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 8.90
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = *****
 SP. GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-107	CARD NUMBER	2	CARD NUMBER	3
DATE	3-31-70	WINDBOX ST,H2O	0.5000E 01	N.G. FLOW,%SCALE	0.9450E 02
TIME	2025	BURNER DP,H2O	0.5300E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.3800E 01	SCREW SPEED,RPM	0.3300E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-.1900E 01	O2 FURN.EX.8-BM	0.5900E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX.8	0.0
SEC.AIR DP,H2O	0.2250E 01	FURN.EX.ST,H2O	0.3800E 01	ELE.CHEM.MILVOLT	0.6000E 01
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.1175E 04
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2907E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.1000E 03	PART.SCRUB.IN	0.6200E 03
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6420E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9420E 03	PRI.AIR FAN IN.	0.7400E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8350E 03	PRI.AIR WGT BULB	0.5250E 02
MODE OF OPER.	2	FURN. EXIT	0.6620E 03	SEC.AIR FAN IN.	0.3800E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.3300E 02
PART.SCR.DP,H2O	0.6100E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5600E 01	VENT.ABS.DP,H2O	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-.7000E 00	ABS CYC.DP,H2O	0.5150E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4500E 01	CARD NUMBER	11	FBA DP,H2O	0.0
CARD NUMBER	10	TEMP.THERMOMETERS,F		FBA DEMIST.DP,H2O	0.0
TEMP.PILOT RECORDER,F		PART.CYC.EXIT	0.1365E 03	CARD NUMBER	12
#1 ORIFICE	0.1370E 03	ABS CYC.EXIT	0.1365E 03	MAKEUP FLOWS	
FBA INLET	0.0	PART.CYC.SUMP	0.1385E 03	PART.INIT.GAL	0.1653E 04
FBA EXIT	0.0	ABS CYC.SUMP	0.1350E 03	PART.FINAL,GAL	0.2084E 04
P.P.EXIT	0.1320E 03	FBA SUMP	0.0	PART.TIME,MIN	0.7850E 02
PART.CYC.SUMP	0.1345E 03	MGO SLAK TANK	0.0	ABS H2O IN.GAL	0.8196E 04
ABS CYC.SUMP	0.1340E 03	MGOH2 TANK	0.1310E 03	ABS H2O FI.GAL	0.8289E 04
FBA SUMP	0.0			ABS H2O TIME,MIN	0.7850E 02
MGO SLAK TANK	0.0			MGO ROTO.SCALE,8	0.3050E 02
MGOH2 TANK	0.1500E 03			MAKEUP SETTING	0.3050E 02
MAKEUP WATER	0.6100E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-107

DATE 3-31-70

TIME OF DAY 2025

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	497.	125.0	---	---	---	---	0.004	39.3	494.	17.6
SECONDARY AIR	4870.	636.8	---	---	---	---	0.003	33.1	4853.	9.0
FURNACE EXIT	5733.	662.0	3089.6	---	---	---	0.040	104.8	5511.	3.8
PART.SCRB.INLET	5733.	620.0	---	---	---	---	0.040	104.8	---	1.4
PART.CYC.EXIT	5748.	136.5	2560.5	---	---	---	0.122	139.1	5124.	-9.5
VENT ABS.INLET	5748.	136.5	---	---	---	---	0.122	139.1	---	-14.0
ABS CYC.EXIT	5967.	136.5	---	---	---	---	0.112	134.8	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5967.	132.0	539.4	*****	*****	*****	0.112	134.8	5366.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	61.0	5.49	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	138.5	5.09	MAKEUP MGO SL.	61.0 9.9	*****
PRODUCT LIQ.	138.5	23.15	PRODUCT LIQ.	150.0 4.1	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	135.0 16.3	*****
			REC.(FLOW NOZ.)	135.0 488.0	*****
				436.3	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.487E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
% FUEL AS COAL	96.1	SO2 ABSORB.EFF	17.12	78.94	*****
COAL FLOW RATE,#/HR	384.7	FLYASH COL.EFF	*****	*****	*****
NAT.GAS FLOW,#/HR	8.6	SO3 ABSORB.EFF	*****	*****	*****
% EXCESS AIR	28.1	NOX ABSORB.EFF	*****	79.9	*****
OXYGEN,%DRY,MEAS.	5.90	GAS VELOCITY,FPS	156.9	31.2	*****
CO2,%DRY-CALC.	12.96	LIQ/GAS,GAL/MCF	14.9	4.4	*****
HUMIDITY,#/# - CALC.	0.040	LIQ/GAS,#/#	2.0	1.7	*****
		PRES.DROP,IN.WG	6.1		*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 101.5
SULFITE/SO2-MOL/MOL = 8.70
SUMP RESID.TIME,MIN = 9.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = *****
SULFITE/SO2-MOL/MOL = *****
SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0272
MOL% TOTAL SULF= 5.14
O2 AT FURN. EX.= 5.90
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-107

DATE 3-31-70

TIME OF DAY 2025

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	14.24	---	28.47	203.8	5505.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	17.92	---	*****	222.3	5511.	CARBON 0.408524
						HYDROGEN 0.439231
PART.SCRUBBER						OXYGEN 1.401169
INPUT, #/HR	17.92	---	*****	2969.	5511.	NITROGEN 5.109885
OUTPUT, #/HR	13.81	---	*****	3173.	5124.	SULFUR 0.007750
SO2 ABSORBERS						FEED RATE, #/SEC= 1.59
INPUT, #/HR	13.81	*****	*****	1464.	5124.	ENTHALPY, BTU/# = 2316.
OUTPUT, #/HR	20.34	14.83	*****	1518.	5366.	

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGD COMPOSITION
COMBINED	3.36	0.5250	---	SLURRY CONC.- GM MGO/100ML = *****
FREE	3.36	0.5250	---	MGO PRESLAKED, NO=0, YES=1 1
	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	3.36	0.5250	---	
MONO(DISSOLVED)	0.96	0.1500	---	
MONO(SOLID)	2.40	0.3750	1.560	
BISULFITE	0.0	0.0	7.950	
MGO	0.50	0.0783	0.0	
SULFATE	0.17	0.0272	0.313	
MAGNESIUM	4.03	0.6305	0.327	
FLYASH	---	---	---	
SOLIDS, MG	---	---	*****	
			7.614	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 8.30
SP-GRAVITY, HYDROM. = 1.0300

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.90
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-108	CARD NUMBER	2	CARD NUMBER	3
DATE	3-31-70	WINDBOX ST,H2O	0.1010E 02	N.G. FLOW,%SCALE	0.9450E 02
TIME	2145	BURNER DP,H2O	0.5600E 01	N.G. STATIC,R.O.	0.8250E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.4700E 01	SCREW SPEED,RPM	0.3300E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX.%-BM	0.6200E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2250E 01	FURN.EX.ST,H2O	0.4100E 01	ELE-CHEM.MILVOLT	0.5800E 01
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.1175E 04
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2907E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.9800E 02	PART.SCRUB.IN	
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.6150E 03
ABS LOAD,PSIG	0.4100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.1450E 03
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.0
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9300E 03	PRI.AIR FAN IN.	0.3700E 02
		NO.2 BANK OUT	0.8350E 03	PRI.AIR WGT BULB	0.3350E 02
CARD NUMBER	7	FURN. EXIT	0.6650E 03	SEC.AIR FAN IN.	0.7400E 02
MODE OF OPER.	2	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.5400E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.6200E 01				
PART.CYC.DP,H2O	0.5600E 01				
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4400E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1800E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.5100E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1370E 03	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.2091E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1370E 03	PART.FINAL,GAL	0.2539E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1380E 03	PART.TIME,MIN	0.7519E 02
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.1360E 03	ABS H2O IN.GAL	0.8291E 04
PART.CYC.SUMP	0.1340E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.8384E 04
ABS CYC.SUMP	0.1320E 03	MGO SLAK TANK	0.2020E 03	ABS H2O TIME,MIN	0.7519E 02
FBA SUMP	0.0	MGOH2 TANK	0.1260E 03	MGO ROTO.SCALE,%	0.3200E 02
MGO SLAK TANK	0.1990E 03			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.1240E 03				
MAKEUP WATER	0.6100E 02				

RUN NUMBER I-108

DATE 3-31-70

TIME OF DAY 2145

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	499.	120.0	---	---	---	---	0.004	34.3	497.	17.6
SECONDARY AIR	4875.	641.3	---	---	---	---	0.006	46.0	4848.	10.1
FURNACE EXIT	5734.	665.0	3156.3	*****	*****	*****	0.042	105.7	5505.	4.1
PART-SCR3-INLET	5734.	615.0	*****	*****	*****	*****	0.042	105.7	---	1.4
PART-CYC-EXIT	5675.	137.0	2607.9	*****	*****	*****	0.124	139.8	5047.	-9.5
VENT ABS-INLET	5675.	137.0	*****	*****	*****	*****	0.124	139.8	---	-13.9
ABS CYC-EXIT	5961.	137.0	*****	*****	*****	*****	0.114	135.2	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5961.	132.0	431.0	*****	*****	*****	0.114	135.2	---	-25.7

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-108

DATE 3-31-70

TIME OF DAY 2145

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	13.94	---	27.88	210.2	5499.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	18.31	---	*****	228.6	5505.	CARBON 0.400983
						HYDROGEN 0.424634
PART.SCRUBBER						OXYGEN 1.402047
INPUT, #/HR	18.31	---	*****	3206.	5505.	NITROGEN 5.116829
OUTPUT, #/HR	13.87	---	*****	3177.	5047.	SULFUR 0.007603
SO2 ABSORBERS						FEED RATE, #/SEC= 1.59
INPUT, #/HR	13.87	*****	*****	1501.	5047.	ENTHALPY, BTU/# = 1618.
OUTPUT, #/HR	33.71	26.64	*****	1476.	5354.	

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
COMBINED	6.12	0.9557	---	SLURRY CONC.- GM MGO/100ML = *****
FREE	6.12	0.9557	---	MGO PRESLAKED, NO=0, YES=1 *****
	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	6.12	0.9557	---	
MONO(DISSOLVED)	1.04	0.1625	---	
MONO(SOLID)	5.08	0.7932	1.690	
BISULFITE	0.0	0.0	16.815	
MGO	0.85	0.1336	0.0	
SULFATE	0.28	0.0434	0.534	
MAGNESIUM	7.25	1.1326	0.521	
FLYASH	---	---	---	
SOLIDS, MG	---	---	---	

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 8.40
SP.GRAVITY, HYDROM. = 1.0300

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-109	CARD NUMBER	2	CARD NUMBER	3
DATE	3-31-70	WINDBOX ST,H2O	0.1020E 02	N.G. FLOW,ZSCALE	0.9500E 02
TIME	2310	BURNER DP,H2O	0.5900E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.4400E 01	SCREW SPEED,RPM	0.3400E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1900E 01	O2 FURN.EX,Z-BM	0.6200E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX,Z	0.0
SEC.AIR DP,H2O	0.2250E 01	FURN.EX,ST,H2O	0.4200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2908E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.9500E 02	PART.SCRUB.IN	0.6220E 03
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9450E 03	PRI.AIR FAN IN.	0.6700E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8420E 03	PRI.AIR WGT BULB	0.5200E 02
MODE OF OPER.	2	FURN. EXIT	0.6750E 03	SEC.AIR FAN IN.	0.3400E 02
PART.SCR.ST,HG	0.1500E 00	COAL-AIR	0.1150E 03	SEC.AIR WET BULB	0.3100E 02
PART.SCR.DP,H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5600E 01	VENT.ABS.DP,H2O	0.1750E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7000E 00	ABS CYC.DP,H2O	0.5200E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1370E 03	PART.CYC.EXIT	0.1380E 03	PART.INIT.GAL	0.2557E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1380E 03	PART.FINAL,GAL	0.2990E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1390E 03	PART.TIME,MIN	0.7885E 02
P.P.EXIT	0.1340E 03	ABS CYC.SUMP	0.1370E 03	ABS H2O IN.GAL	0.8389E 04
PART.CYC.SUMP	0.1345E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.8480E 04
ABS CYC.SUMP	0.1340E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.7885E 02
FBA SUMP	0.0	MGOH2 TANK	0.1470E 03	MGO ROTO.SCALE,Z	0.3100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.3100E 02
MGOH2 TANK	0.1460E 03				
MAKEUP WATER	0.6000E 02				

FLUE GAS DATA

FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
490.	115.0	---	---	---	---	0.006	45.6	488.	17.6
4892.	642.5	---	---	---	---	0.004	33.7	4875.	10.2
5743.	675.0	3259.7	*****	*****	*****	0.040	104.4	5523.	4.2
5743.	622.0	*****	*****	*****	*****	0.040	104.4	---	2.0
5676.	138.0	2716.3	*****	*****	*****	0.121	138.8	5065.	-9.5
5676.	138.0	*****	*****	*****	*****	0.121	138.8	---	-13.9
5958.	138.0	*****	*****	*****	*****	0.110	134.3	---	-25.7
*****	*****	*****	*****	*****	*****	*****	*****	---	*****
*****	*****	*****	*****	*****	*****	*****	*****	---	*****
5958.	134.0	486.2	*****	*****	*****	0.110	134.3	5366.	-25.7

SCRUBBER STREAM DATA

TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI TEMP, F	VENTURI FLOW, #/M	FBA TEMP, F	FBA FLOW, #/M
60.0	5.49	MAKEUP WATER	60.0	9.7	*****	*****
139.0	5.09	MAKEUP MGO SL.	146.0	4.1	*****	*****
139.0	23.15	PRODUCT LIQ.	137.0	16.3	*****	*****
		REC. (SPRAY NOZ)	137.0	488.0	*****	*****
		REC. (FLOW NOZ.)		436.3	*****	*****

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.479E 07
% FUEL AS COAL	96.0
COAL FLOW RATE, #/HR	378.0
NAT. GAS FLOW, #/HR	8.6
% EXCESS AIR	29.5
OXYGEN, % DRY, MEAS.	6.20
CO2, % DRY-CALC.	12.69
HUMIDITY, #/# - CALC.	0.040

SCRUBBER PERFORMANCE

RUBBER PERFORMANCE		PART.
S02 ABSORB.EFF	16.67	*****
FLYASH COL.EFF	*****	*****
S03 ABSORB.EFF	*****	*****
NOX ABSORB.EFF	*****	*****
GAS VELOCITY,FPS	155.3	15.0
LIQ/GAS,GAL/MCF	15.0	2.0
LIQ/GAS,#/#	2.0	6.2
PRES.DROP,IN.WG	6.2	

VENT ABS.

IT ABS.	FLOAT.BED
82.10	
80.0	
31.2	
4.4	
1.7	

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT ² ,	=	112.2
SULFITE/SO ₂ -MOL/MOL	=	10.07
SUMP RESID.TIME, MIN	=	1

FLOATING BED ABSORBER

=====	=====	=====	=====	=====	=====
KG, #MOL/HR-FT2	SULFITE/SO2-MOL/MOL	SUMP RESID.TIME,MIN			

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0231
MOL% TOTAL SULF=	2.64
O2 AT FURN. EX.=	6.20
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER 1-109

DATE 3-31-70

TIME OF DAY 2310

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	13.99	-----	27.97	201.5	5517.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	18.97	-----	*****	220.1	5523.	CARBON 0.400970
						HYDROGEN 0.444789
PART. SCRUBBER						OXYGEN 1.402047
INPUT, #/HR	18.97	-----	*****	2965.	5523.	NITROGEN 5.116842
OUTPUT, #/HR	14.50	-----	*****	3160.	5065.	SULFUR 0.007602
						FEED RATE, #/SEC = 1.60
SO2 ABSORBERS						ENTHALPY, BTU/# = 2542.
INPUT, #/HR	14.50	12.92	*****	1417.	5065.	
OUTPUT, #/HR	32.59	24.82	*****	1466.	5366.	

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	5.95	0.9300	-----	SLURRY CONC. - GM MGO/100ML = 8.70
COMBINED	5.95	0.9300	-----	MGO PRESLAKED, NO=0, YES=1
FREE	0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	5.95	0.9300	-----	
MONO(DISSOLVED)	1.18	0.1844	-----	
MONO(SOLID)	4.77	0.7456	1.917	
BISULFITE	0.0	0.0	15.807	
MGO	0.65	0.1022	0.0	
SULFATE	0.15	0.0231	0.409	
MAGNESIUM	6.75	1.0553	0.277	
FLYASH	-----	-----	-----	
SOLIDS, MG	-----	-----	*****	

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	= 6.80
SP.GRAVITY, HYDROM.	= 1.0260

PARTICULATE SCRUBBER PRODUCT	
ACID STRENGTH, PH	= *****
FLYASH CONC. GM/100ML	= *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	I-110 4-1-70 0045	CARD NUMBER	2	CARD NUMBER	3
PRI-AIR ST, HG	0.1300E 01	WINDBOX ST,H2O	0.1080E 02	N.G. FLOW, %SCALE	0.9450E 02
PRI-AIR DP, H2O	0.2300E 01	BURNER DP, H2O	0.5900E 01	N.G. STATIC, R.O.	0.8300E 01
SEC-AIR ST, HG	0.1500E 01	FURN. ST, H2O	0.4900E 01	SCREW SPEED, RPM	0.3400E 03
SEC-AIR DP, H2O	0.2250E 01	PP EXIT ST, HG	-0.1900E 01	O2 FURN. EX. %BM	0.6100E 01
		PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
		FURN. EX. ST, H2O	0.4900E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P-SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2908E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.9500E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC-AIR ORIF.	0.6550E 03	PART. SCRUB-IN	0.6300E 03
ABS NOZ., PSIG	0.1900E 02	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4400E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.9600E 03	PRI-AIR FAN IN.	0.7050E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.8480E 03	PRI-AIR WGT BULB	0.5300E 02
MODE OF OPER.	2	FURN. EXIT	0.6820E 03	SEC-AIR FAN IN.	0.3200E 02
PART. SCR. ST, HG	0.1500E 00	COAL-AIR	0.1150E 03	SEC-AIR WET BULB	0.3000E 02
PART. SCR. DP, H2O	0.6200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5600E 01	VENT. ABS. DP, H2O	0.1700E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.7000E 00	ABS CYC. DP, H2O	0.5200E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4400E 01			FBA DP, H2O	0.0
				FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1380E 03	TEMP. THERMOMETERS, F	0.1380E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1380E 03	PART. INIT. GAL	0.2997E 04
FBA INLET	0.0	ABS CYC. EXIT	0.1380E 03	PART. FINAL, GAL	0.3518E 04
FBA EXIT	0.0	PART. CYC. SUMP	0.1390E 03	PART. TIME, MIN	0.9583E 02
P.P. EXIT	0.1340E 03	ABS CYC. SUMP	0.1350E 03	ABS H2O IN. GAL	0.8481E 04
PART. CYC. SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.8574E 04
ABS CYC. SUMP	0.1340E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.9583E 02
FBA SUMP	0.0	MGOH2 TANK	0.0	MGO ROTO. SCALE, %	0.2800E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2800E 02
MGOH2 TANK	0.1330E 03				
MAKEUP WATER	0.5900E 02				

RUN NUMBER I-110

DATE 4-1-70

TIME OF DAY 0045

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	490.	115.0					0.005	44.7	488.	17.6
SECONDARY AIR	4892.	640.0					0.004	34.0	4875.	10.8
FURNACE EXIT	5746.	682.0	3081.4				0.040	104.6	5524.	4.9
PART.SCRB.INLET	5746.	630.0					0.040	104.6		2.0
PART.CYC.EXIT	5675.	138.0	2641.8				0.122	139.2	5057.	-9.5
VENT ABS.INLET	5675.	138.0					0.122	139.2		-13.9
ABS CYC.EXIT	5959.	138.0					0.110	134.3		-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	5959.	134.0	522.5	*****	*****	*****	0.110	134.3	5368.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	59.0	5.44	MAKEUP MGO SL.	59.0 8.1	*****
MAKEUP WATER	139.0	5.09	PRODUCT LIQ.	133.0 3.9	*****
PRODUCT LIQ.	139.0	23.15	REC.(SPRAY NOZ)	135.0 16.3	*****
RECIRCULATED LIQ.			REC.(FLOW NOZ.)	135.0 488.0	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.482E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
% FUEL AS COAL	96.1	SO2 ABSORB.EFF	14.27	80.22	*****
COAL FLOW RATE,#/HR	380.7	FLYASH COL.EFF	*****	*****	*****
NAT.GAS FLOW,#/HR	8.6	SO3 ABSORB.EFF	*****	*****	*****
% EXCESS AIR	29.0	NOX ABSORB.EFF	*****	*****	*****
OXYGEN,% DRY, MEAS.	6.10	GAS VELOCITY,FPS	155.3	79.9	*****
CO2,% DRY-CALC.	12.78	LIQ/GAS,GAL/MCF	15.0	31.2	*****
HUMIDITY,#/# - CALC.	0.040	LIQ/GAS,#/#	2.0	4.4	*****
		PRES.DROP,IN.WG	6.2	1.7	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 105.7
SULFITE/SO2-MOL/MOL = 5.96
SUMP RESID.TIME,MIN = 9.1
***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME,MIN
= = =

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0309
MOL% TOTAL SULF= 3.23
O2 AT FURN.EX.= 6.10
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-110

DATE 4-1-70

TIME OF DAY 0045

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.	
INPUT, #/HR	14.08			28.17	203.0	5518.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	17.93			*****	221.4	5524.	CARBON	0.403515
							HYDROGEN	0.444844
							OXYGEN	1.401755
							NITROGEN	5.114498
							SULFUR	0.007653
PART. SCRUBBER		17.93		*****	2945.	5524.	FEED RATE, #/SEC = 1.60	
INPUT, #/HR	14.07			*****	3167.	5057.	ENTHALPY, BTU/# = 2410.	
OUTPUT, #/HR	34.87		*****	*****	1337.	5057.		
			25.62	*****	1436.	5368.		

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	6.33	0.9885	---
COMBINED	6.33	0.9885	---
FREE	0.0	0.0	---
MONO(TOTAL)	6.33	0.9885	---
MONO(DISSOLVED)	0.68	0.1062	1.105
MONO(SOLID)	5.65	0.8822	18.703
BISULFITE	1.60	0.1250	2.325
MGO	0.45	0.0699	0.280
SULFATE	0.20	0.0309	0.371
MAGNESIUM	6.97	1.0893	---
FLYASH	---	---	*****
SOLIDS, MG	---	---	11.326

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

IHC215I CONVERT - ILLEGAL DECIMAL CHARACTER Z

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME PRI. AIR ST, HG PRI. AIR DP, H2O SEC. AIR ST, HG SEC. AIR DP, H2O	I-111 4-1-70 0215 0.1300E 01 0.2200E 01 0.1500E 01 0.2250E 01	CARD NUMBER WINDBOX ST, H2O BURNER DP, H2O FURN. ST, H2O PP EXIT ST, HG PP EXIT DP, H2O FURN-EX. ST, H2O PEEPSITE DP, HG P. SITE ST, PSIG	2 0.1090E 02 0.5800E 01 0.5100E 01 -0.1900E 01 0.5000E 01 0.5100E 01 0.0 0.0	CARD NUMBER N.G. FLOW, %SCALE N.G. STATIC, R.O. SCREW SPEED, RPM O2 FURN-EX. %BM COMB. FURN, EX. % ELE. CHEM. MILVOLT CELL TEMP, F BAROMETRIC, HG	3 0.9450E 02 0.8400E 01 0.3400E 03 0.6100E 01 0.0 0.0 0.0 0.2908E 02
CARD NUMBER PART. NOZ., PSIG PART. LOAD, PSIG ABS NOZ., PSIG ABS LOAD, PSIG ABS ORIF. INCH ABSORBER NOZ. CODE MANOMETER CODE	4 0.4000E 02 0.4100E 02 0.1900E 02 0.4200E 02 0.4400E 01 6 0	CARD NUMBER TEMP. FURN. RECORDER, F SEC. AIR ORIF. WINDBOX-TOP WINDBOX-WEST WINDBOX-BOT. WINDBOX-EAST NO.1 BANK OUT NO.2 BANK OUT FURN. EXIT COAL-AIR	5 0.9800E 02 0.6620E 03 0.6350E 03 0.6350E 03 0.6520E 03 0.9750E 03 0.8600E 03 0.6900E 03 0.1200E 03	CARD NUMBER TEMP. CONTINUED PART. SCRUB. IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI. AIR FAN IN. PRI. AIR WGT BULB SEC. AIR FAN IN. SEC. AIR WET BULB	6 0.6350E 03 0.1550E 03 0.0 0.7000E 03 0.7000E 03 0.7000E 02 0.5300E 02 0.3400E 02 0.3150E 02
CARD NUMBER MODE OF OPER. PART. SCR. ST, HG PART. SCR. DP, H2O PART. CYC. DP, H2O #1 ORIF. ST, HG #1 ORIF. DP, H2O	7 2 0.2000E 00 0.6400E 01 0.5600E 01 -0.7000E 00 0.4400E 01	CARD NUMBER VENT. ABS. DP, H2O ABS CYC. DP, H2O	8 0.1700E 01 0.5100E 01	CARD NUMBER FBA INLET ST, HG FBA SUMP DP, H2O FBA DP, H2O FBA DEMIST. DP, H2O	9 0.0 0.0 0.0 0.0
CARD NUMBER TEMP. PILOT RECORDER, F #1 ORIFICE FBA INLET FBA EXIT P.P. EXIT PART. CYC. SUMP ABS CYC. SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 0.1380E 03 0.0 0.0 0.1330E 03 0.1340E 03 0.1330E 03 0.0 0.0 0.1330E 03 0.5900E 02	CARD NUMBER TEMP. THERMOMETERS, F PART. CYC. EXIT ABS CYC. EXIT PART. CYC. SUMP ABS CYC. SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 0.1380E 03 0.1380E 03 0.1390E 03 0.1370E 03 0.0 0.0 0.1340E 03	CARD NUMBER MAKEUP FLOWS PART. INIT. GAL PART. FINAL, GAL PART. TIME, MIN ABS H2O IN. GAL ABS H2O FI. GAL ABS H2O TIME, MIN MGO ROTO. SCALE, % MAKEUP SETTING	12 0.3526E 04 0.3928E 04 0.9557E 02 0.8575E 04 0.8675E 04 0.9557E 02 0.2800E 02 0.2800E 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-111

DATE 4-1-70

TIME OF DAY 0215

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	478.	120.0	---	---	---	---	0.006	45.2	475.	17.6
SECONDARY AIR	4879.	646.0	---	---	---	---	0.004	35.0	4861.	10.9
FURNACE EXIT	5718.	690.0	2989.0	---	---	---	0.040	104.8	5497.	5.1
PART.SCRB.INLET	5718.	635.0	---	---	---	---	0.040	104.8	---	2.7
PART.CYC.EXIT	5682.	138.0	2642.7	---	---	---	0.118	138.0	5084.	-9.5
VENT ABS.INLET	5682.	138.0	---	---	---	---	0.118	138.0	---	-13.9
ABS CYC.EXIT	5971.	138.0	---	---	---	---	0.106	132.9	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5971.	133.0	520.0	*****	*****	*****	0.106	132.9	5401.	-25.7

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE				TEMP, F	TEMP, F
MAKEUP WATER	59.0	4.21	MAKEUP WATER	8.7	8.7
PRODUCT LIQ.	139.0	5.09	MAKEUP MGO SL.	133.0	133.0
RECIRCULATED LIQ.	139.0	23.15	PRODUCT LIQ.	137.0	137.0
			REC. (SPRAY NOZ)	137.0	137.0
			REC. (FLOW NOZ.)	488.0	488.0
				436.3	436.3

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.480E 07
% FUEL AS COAL	96.1
COAL FLOW RATE, #/HR	378.7
NAT. GAS FLOW, #/HR	8.6
% EXCESS AIR	29.0
OXYGEN, % DRY, MEAS.	6.10
CO2, % DRY-CALC.	12.78
HUMIDITY, #/# - CALC.	0.040

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	11.59
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	155.1
LIQ/GAS, GAL/MCF	15.0
LIQ/GAS, #/#	2.0
PRES. DROP, IN. WG	6.4

VENT ABS.

80.32

79.9
31.2
4.4
1.7

FLOAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	106.7
SULFITE/SO2-MOL/MOL	=	13.94
SUMP RESID. TIME, MIN	=	9.1

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID. TIME, MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0148
MOL% TOTAL SULF=	2.42
O2 AT FURN. EX.=	6.10
O2 AT ABSORB. IN=	*****
O2 AT ABSORB. EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-111

DATE 4-1-70

TIME OF DAY 0215

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR
14.01
17.31

MAGNESIUM

FLYASH
28.02

WATER
202.6
221.1

INPUT FOR EQ. - KIN. PROG.

DRY GAS
5490.
5497.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

17.31
14.15

2330.
3147.

5497.
5084.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

14.15
22.95

14.05
16.09

1330.
1480.

5084.
5401.

*

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION
SLURRY CONC.- GM MGO/100ML = 10.00

MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

3.99
3.99
0.0
3.99
1.60
2.39
0.0
0.29
0.09
4.38

0.6236
0.6236
0.0
0.6236
0.2500
0.3736
0.0
0.0457
0.0148
0.6841

2.600
7.921
0.0
0.183
0.177

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 8.20
SP.GRAVITY, HYDROM. = 1.0270

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	1-112	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST,H2O	0.1090E 02	N.G. FLOW,SCALE	0.9500E 02
TIME	0340	BURNER DP,H2O	0.5300E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.5500E 01	SCREW SPEED,RPM	0.3400E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1900E 01	D2 FURN.EX.Σ-BM	0.6000E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.Σ	0.0
SEC.AIR DP,H2O	0.2250E 01	FURN.EX.ST,H2O	0.5400E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2908E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.9800E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6620E 03	PART.SCRUB.IN	0.6500E 03
ABS NOZ.,PSIG	0.1900E 02	WINDBOX-TOP	0.6380E 03	#1 ORIFICE	0.1550E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6380E 03	FBA INLET	0.0
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.6380E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6550E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9850E 03	PRI.AIR FAN IN.	0.7250E 02
CARD NUMBER	7	NO.2 BANK OUT	0.8750E 03	PRI.AIR WGT BULB	0.5450E 02
MODE OF OPER.	2	FURN. EXIT	0.7000E 03	SEC.AIR FAN IN.	0.3400E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.3250E 02
PART.SCR.DP,H2O	0.6300E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5600E 01	VENT.ABS.DP,H2O	0.1700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.7000E 00	ABS CYC.DP,H2O	0.5100E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1380E 03	TEMP.THERMOMETERS,F	0.1380E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1380E 03	PART.INIT.GAL	0.3935E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1380E 03	PART.FINAL,GAL	0.4419E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1395E 03	PART.TIME,MIN	0.8513E 02
P.P.EXIT	0.1340E 03	ABS CYC.SUMP	0.1380E 03	ABS H2O IN-GAL	0.8676E 04
PART.CYC.SUMP	0.1360E 03	FBA SUMP	0.0	ABS H2O FI-GAL	0.8775E 04
ABS CYC.SUMP	0.1340E 03	MGO SLAK TANK	0.1740E 03	ABS H2O TIME,MIN	0.8513E 02
FBA SUMP	0.0	MGOH2 TANK	0.1280E 03	MGO ROTO.SCALE,Σ	0.2650E 02
MGO SLAK TANK	0.1740E 03			MAKEUP SETTING	0.2650E 02
MGOH2 TANK	0.7300E 02				
MAKEUP WATER	0.5900E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-112

DATE 4-1-70

TIME OF DAY 0340

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	499.	120.0	-----	-----	-----	-----	0.006	46.5	496.	17.6
SECONDARY AIR	4878.	648.3	-----	-----	-----	-----	0.004	37.4	4858.	10.9
FURNACE EXIT	5742.	700.0	2987.9	-----	-----	-----	0.041	105.3	5517.	5.4
PART.SCRB.INLET	5742.	650.0	-----	-----	-----	-----	0.041	105.3	-----	2.7
PART.CYC.EXIT	5667.	138.0	2568.9	-----	-----	-----	0.128	140.8	5022.	-9.5
VENT ABS.INLET	5667.	138.0	-----	-----	-----	-----	0.128	140.8	-----	-13.9
ABS CYC.EXIT	5953.	138.0	-----	-----	-----	-----	0.114	135.4	-----	-25.7
FLOATING BED IN	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED EX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
P.P. EXIT ORIF.	5953.	134.0	519.8	-----	-----	-----	0.114	135.4	5344.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	59.0	5.69	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	139.5	5.09	MAKEUP MGO SL.	59.0 9.7	-----
RECIRCULATED LIQ.	139.5	23.15	PRODUCT LIQ.	73.0 3.8	-----
			REC.(SPRAY NOZ)	138.0 16.3	-----
			REC.(FLOW NOZ.)	138.0 488.0	-----
				436.3	-----

FURNACE PERFORMANCE

	0.485E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
HEAT RELEASE,BTU/HR		SO2 ABSORB.EFF	14.02	79.76	-----
% FUEL AS COAL	96.1	FLYASH COL.EFF	-----	-----	-----
COAL FLOW RATE,#/HR	382.6	SO3 ABSORB.EFF	-----	-----	-----
NAT.GAS FLOW,#/HR	8.6	NOX ABSORB.EFF	-----	-----	-----
% EXCESS AIR	28.6	GAS VELOCITY,FPS	155.6	80.0	-----
OXYGEN,% DRY, MEAS.	6.00	LIQ/GAS,GAL/MCF	15.0	31.1	-----
CO2,% DRY-CALC.	12.87	LIQ/GAS,#/#	2.0	4.4	-----
HUMIDITY,#/# - CALC.	0.041	PRES.DROP,IN.WG	6.3	1.7	-----

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

	KGa,#MOLE/HR-FT2,	=	103.7	KGa,#MOLE/HR-FT2	=	-----	CONC.,GM-MOLE/L=	0.0198
	SULFITE/SO2-MOL/MOL	=	10.70	SULFITE/SO2-MOL/MOL	=	-----	MOL% TOTAL SULF=	1.87
	SUMP RESID.TIME,MIN	=	9.1	SUMP RESID.TIME,MIN	=	-----	O2 AT FURN.EX.=	6.00
	***** MEANS ITEM NOT MEASURED						O2 AT ABSORB.IN=	*****
							O2 AT ABSORB.EX=	*****

FLOATING BED ABSORBER

	KGa,#MOLE/HR-FT2,	=	103.7	KGa,#MOLE/HR-FT2	=	-----	CONC.,GM-MOLE/L=	0.0198
	SULFITE/SO2-MOL/MOL	=	10.70	SULFITE/SO2-MOL/MOL	=	-----	MOL% TOTAL SULF=	1.87
	SUMP RESID.TIME,MIN	=	9.1	SUMP RESID.TIME,MIN	=	-----	O2 AT FURN.EX.=	6.00
	***** MEANS ITEM NOT MEASURED						O2 AT ABSORB.IN=	*****
							O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-112

DATE 4-1-70

TIME OF DAY 0340

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.	
INPUT, #/HR	14.16	---	---	28.31	206.5	5511.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	17.36	---	---	*****	225.1	5517.	CARBON 0.405990	
							HYDROGEN 0.451260	
							OXYGEN 1.401460	
							NITROGEN 5.112221	
							SULFUR 0.007700	
PART. SCRUBBER							FEED RATE, #/SEC= 1.60	
INPUT, #/HR	17.36	---	---	*****	3071.	5517.	ENTHALPY, BTU/# = 2273.	
OUTPUT, #/HR	13.58	---	---	*****	3194.	5022.		
SO2 ABSORBERS								
INPUT, #/HR	13.58		13.65	*****	1434.	5022.		
OUTPUT, #/HR	39.99		30.23	*****	1459.	5344.		

*

*SO2 ABSORBERS-PRODUCT COMP.

	GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION	
TOTAL,	7.45	1.1638	---	SLURRY CONC.- GM MGO/100ML = 10.00	
COMBINED	7.45	1.1638	---	MGO-PRESLAKED, NO=0, YES=1	
FREE	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****	
MONO(TOTAL)	7.45	1.1638	---		
MONO(DISSOLVED)	1.18	0.1844	---		
MONO(SOLID)	6.27	0.9794	1.917		
BISULFITE	0.08	0.0062	20.764		
MGO	0.65	0.1014	0.116		
SULFATE	0.13	0.0198	0.405		
MAGNESIUM	8.22	1.2850	0.238		
FLYASH	---	---	---		
SOLIDS, MG	---	---	---		

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	= 7.80
SP.GRAVITY, HYDROM.	= 1.0220

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	= *****
FLYASH CONC. GM/100ML	= *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

TEST NUMBER	DATE	TIME	CARD NUMBER	2	3
I-113	4-1-70	0500	WINDBOX ST, H2O	0.1120E 02	0.9450E 02
			BURNER DP, H2O	0.5500E 01	0.8300E 01
			FURN. ST, H2O	0.5700E 01	0.3400E 03
			PP EXIT ST, HG	-.1900E 01	0.6000E 01
			PP EXIT DP, H2O	0.5000E 01	0.0
			FURN. EX. ST, H2O	0.5600E 01	0.0
			PEEPSITE DP, HG	0.0	0.0
			P. SITE ST, PSIG	0.0	0.0
					0.2912E 02

CARD NUMBER	4	5	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	CARD NUMBER
PART.LOAD.,PSIG	0.4100E 02	SEC.AIR ORIF.	TEMP.CONTINUED
ABS NOZ.,PSIG	0.1950E 02	WINDBOX-TOP	PART.SCRUB.IN
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	#1 ORIFICE
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	FBA INLET
ABSORBER NOZ. CODE	6	WINDBOX-EAST	AIR HEATER #1
MANOMETER CODE	0	NO.1 BANK OUT	AIR HEATER #2
		NO.2 BANK OUT	PRI.AIR FAN IN.
		FURN. EXIT	PRI.AIR WGT BULB
		COAL-AIR	SEC.AIR FAN IN.
			SEC.AIR WET BULB
CARD NUMBER	7		
MODE OF OPER.	2		
PART.SCR.ST,HG	0.2000E 00		
PART.SCR.DR			

[illegible]

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1380E 03	PART.CYC.EXIT	0.1380E 03	PART.INIT.GAL	0.4427E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1380E 03	PART.FINAL,GAL	0.4875E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.7958E 02
P.P.EXIT	0.1340E 03	ABS CYC.SUMP	0.1360E 03	ABS H20 IN.GAL	0.8777E 04
PART.CYC.SUMP	0.1360E 03	FBA SUMP	0.0	ABS H20 FI.GAL	0.8873E 04
ABS CYC.SUMP	0.1350E 03	MGO SLAK TANK	0.1800E 03	ABS H20 TIME,MIN	0.7958E 02
FBA SUMP	0.0	MGOH2 TANK	0.1240E 03	MGO ROTO.SCALE,%	0.2600E 02
MGO SLAK TANK	0.1790E 03			MAKEUP SETTING	0.2600E 02
MGOH2 TANK	0.1240E 03				
MAKEUP WATER	0.5850E 02				

RUN NUMBER I-113

DATE 4-1-70 TIME OF DAY 0500

FLUE GAS DATA

	FLOW #/HR	TEMP. F	S02 PPM	S03 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	489.	120.0	---	---	---	---	0.005	44.4	486.	17.6
SECONDARY AIR	4873.	646.0	---	---	---	---	0.004	34.7	4855.	11.2
FURNACE EXIT	5726.	715.0	3110.3	---	---	---	0.040	105.0	5504.	5.6
PART.SCRB.INLET	5726.	650.0	---	---	---	---	0.040	105.0	---	2.7
PART.CYC.EXIT	5673.	138.0	2625.5	---	---	---	0.127	140.6	5032.	-9.5
VENT ABS.INLET	5673.	138.0	---	---	---	---	0.127	140.6	---	-13.9
ABS CYC.EXIT	5957.	138.0	---	---	---	---	0.114	135.6	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5957.	134.0	413.5	*****	*****	*****	0.114	135.6	5345.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	58.5	5.63	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	140.0	5.09	MAKEUP MGO SL.	58.5 10.1	*****
PRODUCT LIQ.	140.0	23.15	PRODUCT LIQ.	124.0 3.8	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	136.0 16.9	*****
			REC.(FLOW NOZ.)	136.0 496.1	*****
				436.3	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.484E 07
% FUEL AS COAL	96.1
COAL FLOW RATE,#/HR	381.7
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	28.6
OXYGEN,% DRY, MEAS.	6.00
CO2,% DRY-CALC.	12.87
HUMIDITY,#/# - CALC.	0.040

S02 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	= 120.0
SULFITE/SO2-MOL/MOL	= 10.29
SUMP RESID.TIME,MIN	= 8.8

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

S02 ABSORB.EFF	15.59
FLYASH COL.EFF	*****
S03 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	155.4
LIQ/GAS,GAL/MCF	15.0
LIQ/GAS,#/#	2.0
PRES.DROP,IN.WG	6.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	= *****
SULFITE/SO2-MOL/MOL	= *****
SUMP RESID.TIME,MIN	= *****

VENT ABS.

84.25

80.0
31.2
4.4
1.7

FLOAT.BED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0148
MOL% TOTAL SULF=	1.51
O2 AT FURN.EX.=	6.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-113

DATE 4-1-70

TIME OF DAY 0500

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.12	---	---	28.25	203.8	5497.
OUTPUT, #/HR	18.03	---	---	*****	222.3	5504.
PART. SCRUBBER						
INPUT, #/HR	18.03	---	---	*****	3039.	5504.
OUTPUT, #/HR	13.91	---	---	*****	3189.	5032.

SO2 ABSORBERS

INPUT, #/HR	13.91	*****	*****	1470.	5032.
OUTPUT, #/HR	36.67	29.10	*****	1506.	5345.

*

*SO2 ABSORBERS-
PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	6.67	1.0420	---	SLURRY CONC.- GM MGO/100ML = *****
COMBINED	6.67	1.0420	---	MGO PRESLAKED, NO=0, YES=1 *****
FREE	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	6.67	1.0420	---	
MONO(DISSOLVED)	1.16	0.1812	1.885	
MONO(SOLID)	5.51	0.8608	18.249	
BISULFITE	0.0	0.0	0.0	
MGO	0.87	0.1353	0.541	
SULFATE	0.09	0.0148	0.177	
MAGNESIUM	7.63	1.1921	---	
FLYASH	---	---	*****	
SOLIDS, MG	---	---	14.464	

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-114	CARD NUMBER	3
DATE	4-1-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	0730	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1400E 01	SCREW SPEED, RPM	0.3650E 03
PRI. AIR DP, H2O	0.2300E 01	O2 FURN. EX. %BM	0.5000E 01
SEC. AIR ST, HG	0.1200E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2912E 02
CARD NUMBER	4	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	PART. SCRUB. IN	0.6600E 03
ABS NOZ., PSIG	0.2000E 02	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.4200E 02	FBA INLET	0.0
ABS ORIF. INCH	0.5000E 01	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	PRI. AIR FAN IN.	0.7950E 02
CARD NUMBER	7	PRI. AIR WGT BULB	0.5950E 02
MODE OF OPER.	2	SEC. AIR FAN IN.	0.3500E 02
PART. SCR. ST, HG	0.2000E 00	SEC. AIR WET BULB	0.3350E 02
PART. SCR. DP, H2O	0.7000E 01	CARD NUMBER	9
PART. CYC. DP, H2O	0.5500E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.8000E 00	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4400E 01	FBA DP, H2O	0.0
		FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	12
TEMP. PILOT RECORDER, F		MAKEUP FLOWS	
#1 ORIFICE	0.1390E 03	PART. INIT. GAL	0.4881E 04
FBA INLET	0.0	PART. FINAL, GAL	0.5731E 04
FBA EXIT	0.0	PART. TIME, MIN	0.1500E 03
P.P. EXIT	0.1330E 03	ABS H2O IN. GAL	0.8874E 04
PART. CYC. SUMP	0.1360E 03	ABS H2O FI. GAL	0.9054E 04
ABS CYC. SUMP	0.1320E 03	ABS H2O TIME, MIN	0.1500E 03
FBA SUMP	0.0	MGO ROTO. SCALE, %	0.2700E 02
MGO SLAK TANK	0.0	MAKEUP SETTING	0.2700E 02
MGOH2 TANK	0.1300E 03		
MAKEUP WATER	0.6000E 02		
CARD NUMBER	11	CARD NUMBER	8
TEMP. THERMOMETERS, F		VENT. ABS. DP, H2O	0.1800E 01
PART. CYC. EXIT	0.1400E 03	ABS CYC. DP, H2O	0.4600E 01
ABS CYC. EXIT	0.1380E 03		
PART. CYC. SUMP	0.1410E 03		
ABS CYC. SUMP	0.1340E 03		
FBA SUMP	0.0		
MGO SLAK TANK	0.0		
MGOH2 TANK	0.1350E 03		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-114

DATE 4-1-70

TIME OF DAY 0730

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	496.	105.0					0.007	52.5	492.	19.0
SECONDARY AIR	4794.	640.0					0.004	38.3	4774.	10.0
FURNACE EXIT	5672.	750.0	3463.7				0.043	107.4	5437.	6.0
PART.SCRB.INLET	5672.	660.0					0.043	107.4		2.7
PART.CYC.EXIT	5653.	140.0	3315.3				0.133	141.9	4991.	-10.8
VENT ABS.INLET	5653.	140.0					0.133	141.9		-15.2
ABS CYC.EXIT	5993.	138.0					0.121	137.9		-21.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	5993.	133.0	590.3				0.121	137.9	5346.	-21.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.67	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	141.0	5.09	MAKEUP MGO SL.	60.0 10.0	*****
PRODUCT LIQ.	141.0	23.15	PRODUCT LIQ.	130.0 3.8	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	134.0 16.9	*****
			REC.(FLOW NOZ.)	134.0 504.0	*****
				465.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.508E 07	SCRUBBER PERFORMANCE	VENT ABS.	FLOAT.BED
% FUEL AS COAL	96.1	SO2 ABSORB.EFF	82.20	*****
COAL FLOW RATE,#/HR	401.1	FLYASH COL.EFF	*****	*****
NAT.GAS FLOW,#/HR	8.9	SO3 ABSORB.EFF	*****	*****
% EXCESS AIR	23.8	NOX ABSORB.EFF	*****	*****
OXYGEN,% DRY, MEAS.	5.00	GAS VELOCITY,FPS	79.6	*****
CO2,% DRY-CALC.	13.73	LIQ/GAS,GAL/MCF	33.4	*****
HUMIDITY,#/# - CALC.	0.043	LIQ/GAS,#/#	4.7	*****
		PRES.DROP,IN.WG	1.8	*****

SO2 ABSORPTION PARAMETERS
VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = 111.6
SULFITE/SO2-MOL/MOL = 8.26
SUMP RESID.TIME,MIN = 7.8

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME,MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0138
MOL% TOTAL SULF= 1.95
O2 AT FURN.EX.= 5.00
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-114

DATE 4-1-70

TIME OF DAY 0730

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	14.84	---	29.68	216.5	5430.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	19.76	---	*****	235.7	5437.	CARBON 0.430696
						HYDROGEN 0.488369
PART. SCRUBBER						OXYGEN 1.398523
INPUT, #/HR	19.76	---	*****	3071.	5437.	NITROGEN 5.089487
OUTPUT, #/HR	17.37	---	*****	3211.	4991.	SULFUR 0.008171

SO2 ABSORBERS						FEED RATE, #/SEC = 1.58
INPUT, #/HR	17.37	13.23	*****	1471.	4991.	ENTHALPY, BTU/# = 1273.
OUTPUT, #/HR	27.90	18.14	*****	1580.	5346.	

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
4.75	0.7428	---	SLURRY CONC.- GM MGO/100ML = 9.60
4.67	0.7295	---	MGO PRESLAKED, NO=0, YES=1
0.09	0.0133	---	% SLAKED TO MG(OH)2, MEAS. = *****
4.58	0.7161	---	
1.10	0.1719	---	
3.48	0.5443	1.787	PRODUCT MG BASE PHYSICAL PROPERTIES
0.20	0.0156	11.538	ACID STRENGTH, PH = 6.80
0.0	0.0	0.291	SP.GRAVITY, HYDROM. = 1.0360
0.09	0.0138	0.0	
4.76	0.7433	0.166	

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-115	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST,H2O	0.1000E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	0800	BURNER DP,H2O	0.5500E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1400E 01	FURN. ST,H2O	0.5000E 01	SCREW SPEED,RPM	0.3200E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1200E 01	02 FURN.EX.%-BM	0.5000E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX.ST,H2O	0.5200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2912E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.1050E 03	PART.SCRUB.IN	0.6550E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.5000E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1005E 04	PRI.AIR FAN IN.	0.7750E 02
CARD NUMBER	7	NO.2 BANK OUT	0.9000E 03	PRI.AIR WGT BULB	0.5800E 02
MODE OF OPER.	2	FURN. EXIT	0.7600E 03	SEC.AIR FAN IN.	0.4200E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.3900E 02
PART.SCR.DP,H2O	0.6000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5500E 01	VENT.ABS.DP,H2O	0.1800E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.9000E 00	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4200E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.5731E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1410E 03	PART.FINAL,GAL	0.6332E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1410E 03	PART.TIME,MIN	0.1050E 03
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.1390E 03	ABS H2O IN.GAL	0.9054E 04
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.9104E 04
ABS CYC.SUMP	0.1360E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.1050E 03
FBA SUMP	0.0	MGOH2 TANK	0.1290E 03	MGO ROTO.SCALE,%	0.2700E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2700E 02
MGOH2 TANK	0.1260E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-115

DATE 4-1-70

TIME OF DAY 0800

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	483.	110.0	---	---	---	---	0.007	50.6	479.	19.0
SECONDARY AIR	4992.	635.0	---	---	---	---	0.005	42.7	4968.	10.0
FURNACE EXIT	5871.	760.0	3416.1	---	---	---	0.044	107.7	5624.	5.2
PART.SCRB.INLET	5871.	655.0	---	---	---	---	0.044	107.7	---	2.7
PART.CYC.EXIT	5490.	142.0	3295.5	---	---	---	0.143	144.2	4802.	-12.2
VENT ABS.INLET	5490.	142.0	---	---	---	---	0.143	144.2	---	-16.4
ABS CYC.EXIT	6016.	141.0	---	---	---	---	0.125	139.5	---	-16.3
FLOATING BED IN	6016.	136.0	558.8	---	---	---	0.125	139.5	---	---
FLOATING BED EX	6016.	136.0	558.8	---	---	---	0.125	139.5	---	---
P.P. EXIT ORIF.	6016.	136.0	558.8	---	---	---	0.125	139.5	5347.	-16.3

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.72	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	141.0	4.16	MAKEUP MGO SL.	60.0 3.9	60.0 3.9
PRODUCT LIQ.	141.0	23.15	PRODUCT LIQ.	126.0 3.8	126.0 3.8
RECIRCULATED LIQ.	141.0	23.15	REC.(SPRAY NOZ)	139.0 17.5	139.0 17.5
			REC.(FLOW NOZ.)	504.0 465.1	504.0 465.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.525E 07
% FUEL AS COAL	96.3
COAL FLOW RATE,#/HR	415.4
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	23.8
OXYGEN,% DRY, MEAS.	5.00
CO2,% DRY-CALC.	13.74
HUMIDITY,#/# - CALC.	0.044

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	114.8
SULFITE/SO2-MOL/MOL	=	8.46
SUMP RESID.TIME,MIN	=	7.5

**** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	3.53
FLYASH COL.EFF	---
SO3 ABSORB.EFF	---
NOX ABSORB.EFF	---
GAS VELOCITY,FPS	153.3
LIQ/GAS,GAL/MCF	15.2
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.0

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	---
SULFITE/SO2-MOL/MOL	=	---
SUMP RESID.TIME,MIN	=	---

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0203
MOL% TOTAL SULF=	2.66
O2 AT FURN.EX.=	5.00
O2 AT ABSORB.IN=	---
O2 AT ABSORB.EX=	---

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-115

DATE 4-1-70

TIME OF DAY 0800

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	15.37	---	---	30.74	227.6	5617.	
OUTPUT, #/HR	20.16	---	---	*****	246.8	5624.	
PART. SCRUBBER							
INPUT, #/HR	20.16	---	---	*****	3108.	5624.	
OUTPUT, #/HR	16.61	---	---	*****	2769.	4802.	
SO2 ABSORBERS							
INPUT, #/HR	16.61	*****		*****	1154.	4802.	
OUTPUT, #/HR	28.78	18.56		*****	1635.	5347.	

FEED RATE, #/SEC = 1.63

ENTHALPY, BTU/# = 926.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	4.75	GM SO2/100ML	GRAM/100ML	MAKEUP MGO COMPOSITION
COMBINED	4.57			SLURRY CONC.- GM MGO/100ML = *****
FREE	0.18			MGO PRESLAKED, NO=0, YES=1 1
MONO(TOTAL)	4.39			% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	1.12			
MONO(SOLID)	3.27			
BISULFITE	0.32			
MGO	0.0			
SULFATE	0.13			
MAGNESIUM	4.70			
FLYASH	---			
SOLIDS, MG	---			

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	=	*****
SP.GRAVITY, HYDROM.	=	*****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	=	*****
FLYASH CONC. GM/100ML	=	0.54

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	I-116 4-1-70 0930	CARD NUMBER	2	CARD NUMBER	3
PRI.AIR ST, HG	0.1400E 01	WINDBOX ST,H2O	0.1000E 02	N.G. FLOW,%SCALE	0.9800E 02
PRI.AIR DP,H2O	0.2400E 01	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8000E 01
SEC.AIR ST,HG	0.1400E 01	FURN. ST,H2O	0.6000E 01	SCREW SPEED,RPM	0.3900E 03
SEC.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1600E 01	02 FURN.EX.%-BM	0.4000E 01
		PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX.%	0.0
		FURN.EX.ST,H2O	0.6000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2912E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1050E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	0.6650E 03
ABS NOZ.,PSIG	0.2000E 02	WINDBOX-TOP	0.6250E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF.INCH	0.5000E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1035E 04	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9300E 03	PRI.AIR FAN IN.	0.7750E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7700E 03	PRI.AIR WGT BULB	0.5800E 02
MODE OF OPER.	2	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.4200E 02
PART.SCR.ST,HG	0.3000E 00	COAL-AIR		SEC.AIR WET BULB	0.3900E 02
PART.SCR.DP,H2O	0.7500E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5200E 01	VENT.ABS.DP,H2O	0.1800E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	FBA DEMIST.DP,H2O	0.0
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		CARD NUMBER	12
#1 ORIFICE	0.1380E 03	PART.CYC.EXIT	0.1410E 03	MAKEUP FLOWS	
FBA INLET	0.0	ABS CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.6332E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1420E 03	PART.FINAL,GAL	0.6638E 04
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.1390E 03	PART.TIME,MIN	0.5150E 02
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O IN.GAL	0.9184E 04
ABS CYC.SUMP	0.1360E 03	MGO SLAK TANK	0.0	ABS H2O FI.GAL	0.9235E 04
FBA SUMP	0.0	MGOH2 TANK	0.1260E 03	ABS H2O TIME,MIN	0.5200E 02
MGO SLAK TANK	0.0			MGO ROTO.SCALE,%	0.2700E 02
MGOH2 TANK	0.1250E 03			MAKEUP SETTING	0.2700E 02
MAKEUP WATER	0.6000E 02				

RUN NUMBER I-116

DATE 4-1-70

TIME OF DAY 0930

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	504.	110.0	---	---	---	---	0.007	50.6	501.	19.0
SECONDARY AIR	4788.	635.0	---	---	---	---	0.005	42.8	4764.	10.0
FURNACE EXIT	5698.	770.0	3369.6	*****	*****	*****	0.046	109.5	5447.	6.0
PART.SCRB.INLET	5698.	665.0	*****	*****	*****	*****	0.046	109.5	---	4.1
PART.CYC.EXIT	5649.	141.0	3234.5	*****	*****	*****	0.138	143.2	4965.	-10.8
VENT ABS.INLET	5649.	141.0	*****	*****	*****	*****	0.138	143.2	---	-15.2
ABS CYC.EXIT	5980.	142.0	*****	*****	*****	*****	0.125	139.1	---	-21.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5980.	136.0	563.9	*****	*****	*****	0.125	139.1	5315.	-21.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.95	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	142.0	5.09	MAKEUP MGO SL.	60.0 8.1	*****
RECIRCULATED LIQ.	142.0	23.15	PRODUCT LIQ.	125.0 3.8	*****
			REC.(SPRAY NOZ)	139.0 15.7	*****
			REC.(FLOW NOZ.)	139.0 504.0	*****
				465.1	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.539E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	426.5
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	19.0
OXYGEN,% DRY, MEAS.	4.00
CO2,% DRY-CALC.	14.61
HUMIDITY,#/# - CALC.	0.046

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	4.01
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	156.0
LIQ/GAS,GAL/MCF	15.0
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	7.5

FLOAT.BED

VENT ABS.	82.57
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****
*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	112.0
SULFITE/SO2-MOL/MOL	=	7.46
SUMP RESID.TIME,MIN	=	8.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0171
MOL% TOTAL SULF=	2.12
O2 AT FURN.EX.=	4.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

**** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-116

DATE 4-1-70

TIME OF DAY 0930

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	15.78	---	---	31.56	232.1	5439.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	19.19	---	---	*****	251.2	5447.	CARBON	0.455379
							HYDROGEN	0.505155
							OXYGEN	1.395646
							NITROGEN	5.066760
							SULFUR	0.008651
PART. SCRUBBER							FEED RATE, #/SEC=	1.58
INPUT, #/HR	19.19	---	---	*****	3226.	5447.		
OUTPUT, #/HR	16.79	---	---	*****	3234.	4965.	ENTHALPY, BTU/# =	220.
SO2 ABSORBERS								
INPUT, #/HR	16.79		12.54	*****	1382.	4965.		
OUTPUT, #/HR	29.48		20.10	*****	1514.	5315.		

*

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	5.50	0.8586	---	SLURRY CONC.- GM MGO/100ML = 9.10
COMBINED	5.50	0.8586	---	MGO PRESLAKED, NO=0, YES=1 1
FREE	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	5.50	0.8586	---	
MONO(DISSOLVED)	0.96	0.1500	---	
MONO(SOLID)	4.54	0.7086	1.560	
BISULFITE	0.16	0.0125	15.023	
MGO	0.09	0.0136	0.233	
SULFATE	0.11	0.0171	0.054	
MAGNESIUM	5.69	0.8893	0.205	
FLYASH	---	---	---	
SOLIDS, MG	---	---	---	

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.60
SP.GRAVITY, HYDROM. = 1.0360

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	1-117	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST, H2O	0.1500E 02	N.G. FLOW, %SCALE	0.9800E 02
TIME	1100	BURNER DP, H2O	0.5000E 01	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.5000E 01	SCREW SPEED, RPM	0.3750E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1800E 01	D2 FURN. EX. % - BM	0.4000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.5200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2908E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1200E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.6800E 03
ABS NOZ., PSIG	0.0	WINDBOX - TOP	0.6300E 03	#1 ORIFICE	0.1600E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX - WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4600E 01	WINDBOX - BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	0	WINDBOX - EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANGMETER CODE	0	NO. 1 BANK OUT	0.1080E 04	PRI. AIR FAN IN.	0.7600E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.9800E 03	PRI. AIR WGT BULB	0.5800E 02
MODE OF OPER.	2	FURN. EXIT	0.8000E 03	SEC. AIR FAN IN.	0.5200E 02
PART. SCR. ST, HG	0.2000E 00	COAL - AIR	0.1100E 03	SEC. AIR WET BULB	0.4500E 02
PART. SCR. DP, H2O	0.7000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5200E 01	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.1800E 01	ABS CYC. DP, H2O	0.4800E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4400E 01	CARD NUMBER	11	FBA DP, H2O	0.0
CARD NUMBER	10	TEMP. THERMOMETERS, F	0.1400E 03	FBA DEMIST. DP, H2O	0.0
TEMP. PILOT RECORDER, F	0.1400E 03	PART. CYC. EXIT	0.1410E 03	CARD NUMBER	12
#1 ORIFICE	0.0	ABS CYC. EXIT	0.1430E 03	MAKEUP FLOWS	
FBA INLET	0.0	PART. CYC. SUMP	0.1400E 03	PART. INIT. GAL	0.7966E 04
FBA EXIT	0.1380E 03	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.8730E 04
P. P. EXIT	0.1360E 03	FBA SUMP	0.0	PART. TIME, MIN	0.1350E 03
PART. CYC. SUMP	0.1370E 03	MGO SLAK TANK	0.1150E 03	ABS H2O IN. GAL	0.9434E 04
ABS CYC. SUMP	0.0	MGOH2 TANK	0.0	ABS H2O FI. GAL	0.9600E 04
FBA SUMP	0.1860E 03	CARD NUMBER	12	ABS H2O TIME, MIN	0.1350E 03
MGO SLAK TANK	0.1050E 03	MAKEUP WATER	0.6000E 02	MGO ROTO. SCALE, %	0.2700E 02
MGOH2 TANK				MAKEUP SETTING	0.2700E 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-117

DATE 4-1-70

TIME OF DAY 1100

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.	
INPUT, #/HR	15.82						INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	20.37			31.64	235.6	5453.	CARBON	0.455393
				*****	254.8	5461.	HYDROGEN	0.509135
PART. SCRUBBER							OXYGEN	1.395647
INPUT, #/HR	20.37			*****	3085.	5461.	NITROGEN	5.066745
OUTPUT, #/HR	17.28			*****	3232.	4862.	SULFUR	0.008652

SO2 ABSORBERS

INPUT, #/HR	17.28	*****	1527.	4862.	FEED RATE, #/SEC =	1.59
OUTPUT, #/HR	29.10	*****	1537.	5254.	ENTHALPY, BTU/# =	168.

*SO2 ABSORBERS-
PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	5.82			SLURRY CONC. - GM MGO/100ML =
COMBINED	5.82	0.9094		MGO PRESLAKED, NO=0, YES=1
FREE	0.0	0.9094		% SLAKED TO MG(OH)2, MEAS. =
MONO(TOTAL)	5.82	0.0		*****
MONO(DISSOLVED)	*****	0.9094		*****
MONO(SOLID)	*****	*****		*****
BISULFITE	*****	*****		*****
MGO	*****	*****		*****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.70
SP.GRAVITY, HYDROM. = 1.0380

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME PRI. AIR ST, HG PRI. AIR DP, H2O SEC. AIR ST, HG SEC. AIR DP, H2O	I-118 4-1-70 1330 0.1400E 01 0.2100E 01 0.1400E 01 0.2200E 01	CARD NUMBER WINDBOX ST, H2O BURNER DP, H2O FURN. ST, H2O PP EXIT ST, HG PP EXIT DP, H2O FURN. EX. ST, H2O PEEPSITE DP, HG P. SITE ST, PSIG	2 0.1000E 02 0.5500E 01 0.6000E 01 -0.1800E 01 0.5000E 01 0.6200E 01 0.0 0.0	CARD NUMBER N.G. FLOW, %SCALE N.G. STATIC, R.O. SCREW SPEED, RPM O2 FURN. EX. %BM COMB. FURN. EX. % ELE. CHEM. MILVOLT CELL TEMP, F BAROMETRIC, HG	3 0.9800E 02 0.8000E 01 0.3900E 03 0.4000E 01 0.0 0.0 0.0 0.2908E 02
CARD NUMBER PART. NOZ., PSIG PART. LOAD, PSIG ABS NOZ., PSIG ABS LOAD, PSIG ABS ORIF. INCH ABSORBER NOZ. CODE MANOMETER CODE	4 0.4000E 02 0.4200E 02 0.0 0.4000E 02 0.4400E 01 6 0	CARD NUMBER TEMP. FURN. RECORDER, F SEC. AIR ORIF. WINDBOX-TOP WINDBOX-WEST WINDBOX-BOT. WINDBOX-EAST NO.1 BANK OUT NO.2 BANK OUT FURN. EXIT COAL-AIR	5 0.1200E 03 0.6500E 03 0.6200E 03 0.6250E 03 0.6400E 03 0.1090E 04 0.9900E 03 0.8200E 03 0.1100E 03	CARD NUMBER TEMP. CONTINUED PART. SCRUB. IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI. AIR FAN IN. PRI. AIR WGT BULB SEC. AIR FAN IN. SEC. AIR WET BULB	6 0.6900E 03 0.1600E 03 0.0 0.7000E 03 0.7000E 03 0.7700E 02 0.5900E 02 0.5400E 02 0.4500E 02
CARD NUMBER MODE OF OPER. PART. SCR. ST, HG PART. SCR. DP, H2O PART. CYC. DP, H2O #1 ORIF. ST, HG #1 ORIF. DP, H2O	7 0.2000E 00 0.6800E 01 0.5300E 01 -0.1900E 01 0.4400E 01	CARD NUMBER VENT. ABS. DP, H2O ABS CYC. DP, H2O	8 0.1600E 01 0.4800E 01	CARD NUMBER FBA INLET ST, HG FBA SUMP DP, H2O FBA DP, H2O FBA DEMIST. DP, H2O	9 0.0 0.0 0.0 0.0
CARD NUMBER TEMP. PILOT RECORDER, F #1 ORIFICE FBA INLET FBA EXIT P.P. EXIT PART. CYC. SUMP ABS CYC. SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 0.1390E 03 0.0 0.0 0.1380E 03 0.1370E 03 0.1380E 03 0.0 0.0 0.1200E 03 0.6000E 02	CARD NUMBER TEMP. THERMOMETERS, F PART. CYC. EXIT ABS CYC. EXIT PART. CYC. SUMP ABS CYC. SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 0.1400E 03 0.1420E 03 0.1400E 03 0.1410E 03 0.0 0.0 0.1180E 03	CARD NUMBER MAKEUP FLOWS PART. INIT. GAL PART. FINAL, GAL PART. TIME, MIN ABS H2O IN. GAL ABS H2O FI. GAL ABS H2O TIME, MIN MGO ROTO. SCALE, % MAKEUP SETTING	12 0.7966E 04 0.8730E 04 0.1350E 03 0.9434E 04 0.9600E 04 0.1350E 03 0.2900E 07 0.2900E 07

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-118

DATE 4-1-70

TIME OF DAY 1330

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	471.	110.0	---	---	---	---	0.007	53.3	468.	19.0
SECONDARY AIR	4722.	633.8	---	---	---	---	0.005	43.7	4698.	10.0
FURNACE EXIT	5592.	820.0	3593.5	---	---	---	0.046	109.7	5344.	6.2
PART.SCRB.INLET	5592.	690.0	---	---	---	---	0.046	109.7	---	2.7
PART.CYC.EXIT	5532.	140.0	3547.2	---	---	---	0.143	142.8	4839.	-25.7
VENT ABS.INLET	5532.	140.0	---	---	---	---	0.143	142.8	---	-30.1
ABS CYC.EXIT	4733.	142.0	---	---	---	---	---	213.8	---	-24.4
FLOATING BED IN	---	---	---	---	---	---	---	---	---	---
FLOATING BED EX	---	---	---	---	---	---	---	---	---	---
P.P. EXIT ORIF.	4733.	138.0	681.8	---	---	---	---	---	---	---

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.66	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	140.0	5.09	MAKEUP MGO SL.	60.0 10.2	---
PRODUCT LIQ.	140.0	23.15	PRODUCT LIQ.	120.0 14.3	---
RECIRCULATED LIQ.	---	---	REC.(SPRAY NOZ)	141.0 0.0	---
---	---	---	REC.(FLOW NOZ.)	436.3	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.529E 07
% FUEL AS COAL	96.3
COAL FLOW RATE,#/HR	418.1
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	19.0
OXYGEN,% DRY, MEAS.	4.00
CO2,% DRY-CALC.	14.60
HUMIDITY,#/# - CALC.	0.046

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = -0.0
SULFITE/SO2-MOL/MOL = *****
SUMP RESID.TIME,MIN = 9.2

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.29
FLYASH COL.EFF	---
SO3 ABSORB.EFF	---
NOX ABSORB.EFF	---
GAS VELOCITY,FPS	159.4
LIQ/GAS,GAL/MCF	14.6
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.8

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME,MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= *****
MOL% TOTAL SULF= *****
O2 AT FURN. EX.= 4.00
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-118

DATE 4-1-70

TIME OF DAY 1330

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	15.47	---	30.94	228.7	5336.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	20.08	---	*****	247.8	5344.	CARBON 0.455274
						HYDROGEN 0.512305
PART. SCRUBBER						OXYGEN 1.395637
INPUT, #/HR	20.08	---	*****	3078.	5344.	NITROGEN 5.066862
OUTPUT, #/HR	17.95	---	*****	3241.	4839.	SULFUR 0.008645

SO2 ABSORBERS						FEED RATE, #/SEC= 1.55
INPUT, #/HR	17.95	*****	*****	*****	4839.	ENTHALPY, BTU/# = 135.
OUTPUT, #/HR	22.76	18.91	*****	5510.	-2.	

*SO2 ABSORBERS- PRODUCT COMP.	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	5.30	0.8287	---	SLURRY CONC.- GM MGO/100ML = 9.80
COMBINED	5.30	0.8287	---	MGO PRESLAKED, NO=0, YES=1
FREE	0.0	0.0	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(TOTAL)	5.30	0.8287	---	
MONO(DISSOLVED)	0.96	0.1500	---	
MONO(SOLID)	4.34	0.6787	1.560	
BISULFITE	0.32	0.0250	14.388	
MGO	0.56	0.0879	0.465	
SULFATE	*****	*****	0.352	
MAGNESIUM	5.87	0.9166	*****	PRODUCT MG BASE PHYSICAL PROPERTIES
FLYASH	---	---	---	ACID STRENGTH, PH = *****
SOLIDS, MG	---	---	---	SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-119	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST,H2O	0.1000E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	1400	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.5000E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX,%-BM	0.3800E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX,ST,H2O	0.5000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2908E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1200E 03	TEMP.CONTINUED	0.6800E 03
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	0.1600E 03
ABS NOZ.,PSIG	0.0	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.0
ABS LOAD,PSIG	0.4100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.7000E 03
ABS ORIF.INCH	0.4300E 01	WINDBOX-BOT.	0.6400E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1070E 04	PRI.AIR FAN IN.	0.7600E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.9500E 03	PRI.AIR WGT BULB	0.5800E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7950E 03	SEC.AIR FAN IN.	0.5400E 02
MODE OF OPER.	2	FURN. EXIT	0.1100E 03	SEC.AIR WET BULB	0.4700E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR		CARD NUMBER	9
PART.SCR.DP,H2O	0.7000E 01	CARD NUMBER	8	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.5400E 01	VENT.ABS.DP,H2O	0.1800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.8000E 00	ABS CYC.DP,H2O	0.4600E 01	FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4200E 01			FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1410E 03	TEMP.THERMOMETERS,F	0.1420E 03	MAKEUP FLOWS	0.7966E 04
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1410E 03	PART.INIT.GAL	0.8730E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1430E 03	PART.FINAL,GAL	0.1350E 03
FBA EXIT	0.0	PART.CYC.SUMP	0.1390E 03	PART.TIME,MIN	0.9434E 04
P.P.EXIT	0.1370E 03	ABS CYC.SUMP	0.0	ABS H2O IN-GAL	0.9600E 04
PART.CYC.SUMP	0.1390E 03	FBA SUMP	0.1800E 03	ABS H2O FI-GAL	0.1350E 03
ABS CYC.SUMP	0.1370E 03	MGO SLAK TANK	0.1000E 03	ABS H2O TIME,MIN	0.2500E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO.SCALE,%	0.2500E 02
MGO SLAK TANK	0.1860E 03			MAKEUP SETTING	0.2500E 02
MGOH2 TANK	0.9800E 02				
MAKEUP WATER	0.6000E 02				

RUN NUMBER I-119

DATE 4-1-70

TIME OF DAY 1400

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	481.	110.0	---	---	---	---	0.007	51.9	477.	16.3
SECONDARY AIR	4819.	637.5	---	---	---	---	0.006	48.1	4790.	10.0
FURNACE EXIT	5711.	795.0	3304.0	*****	*****	*****	0.048	110.4	5451.	5.0
PART.SCRB.INLET	5711.	680.0	*****	*****	*****	*****	0.048	110.4	---	2.7
PART.CYC.EXIT	5509.	142.0	3396.5	*****	*****	*****	0.141	143.8	4829.	-10.8
VENT ABS.INLET	5509.	142.0	*****	*****	*****	*****	0.141	143.8	---	-15.0
ABS CYC.EXIT	5948.	141.0	*****	*****	*****	*****	0.127	139.2	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5948.	137.0	619.7	*****	*****	*****	0.127	139.2	5277.	-24.4

SCRUBBER STREAM DATA

ARTICULATE		VENTURI ABSORBER		FBA	
TEMP, F	FLOW, GPM	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
60.0	5.66	60.0	10.2	60.0	10.2
143.0	5.13	98.0	3.7	98.0	3.7
143.0	23.15	139.0	16.3	139.0	16.3
		139.0	0.0	139.0	0.0
			431.3		431.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.545E 07	SCRUBBER PERFORMANCE	PART.
% FUEL AS COAL	96.4	S02 ABSORB.EFF	-2.80
COAL FLOW RATE,#/HR	431.7	FLYASH COL.EFF	*****
NAT.GAS FLOW,#/HR	8.9	S03 ABSORB.EFF	*****
% EXCESS AIR	18.1	NOX ABSORB.EFF	*****
OXYGEN,% DRY, MEAS.	3.80	GAS VELOCITY,FPS	152.8
CO2,% DRY-CALC.	14.78	LIQ/GAS,GAL/MCF	15.3
HUMIDITY,#/# - CALC.	0.048	LIQ/GAS,#/#	2.1
		PRES.DROP,IN.WG	7.0

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0148
MOL% TOTAL SULF=	2.06
02 AT FURN. EX.=	3.80
02 AT ABSORB.IN=	*****
02 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-119

DATE 4-1-70

TIME OF DAY 1400

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	15.97	-----	31.95	240.1	5443.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	18.82	-----	*****	259.3	5451.	CARBON 0.460283
						HYDROGEN 0.513485
PART. SCRUBBER						OXYGEN 1.395075
INPUT, #/HR	18.82	-----	*****	3089.	5451.	NITROGEN 5.062245
OUTPUT, #/HR	17.14	-----	*****	3245.	4829.	SULFUR 0.008746

SO2 ABSORBERS

INPUT, #/HR	17.14	13.25	*****	1492.	4829.	FEED RATE, #/SEC= 1.59
OUTPUT, #/HR	27.52	19.13	*****	1566.	5277.	ENTHALPY, BTU/# = -315.

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	4.83	0.7550	GRAM/ 100ML	MAKEUP MGO COMPOSITION
COMBINED	4.83	0.7550	-----	SLURRY CONC.- GM MGO/100ML = 10.00
FREE	0.0	0.0	-----	MGO PRESLAKED, ND=0, YES=1
MONO(TOTAL)	4.83	0.7550	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	0.94	0.1469	-----	
MONO(SOLID)	3.89	0.6082	1.527	
BISULFITE	0.08	0.0062	12.893	
MGO	0.28	0.0436	0.116	
SULFATE	0.09	0.0148	0.174	
MAGNESIUM	5.21	0.8134	0.177	
FLYASH	-----	-----	-----	
SOLIDS, MG	-----	-----	-----	

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.80
SP.GRAVITY, HYDROM. = 1.0340

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-120	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST,H2O	0.9000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1530	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1400E 01	FURN. ST,H2O	0.6000E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	02 FURN.EX.%-BM	0.4100E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2100E 01	FURN.EX.ST,H2O	0.6000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2908E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1200E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4100E 02	SEC.AIR ORIF.	0.6500E 03	PART.SCRUB.IN	
ABS NOZ.,PSIG	0.0	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.6900E 03
ABS LOAD,PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.1600E 03
ABS ORIF.INCH	0.4300E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.0
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1080E 04	PRI.AIR FAN IN.	0.7600E 02
		NO.2 BANK OUT	0.9600E 03	PRI.AIR WGT BULB	0.5900E 02
CARD NUMBER	7	FURN. EXIT	0.8000E 03	SEC.AIR FAN IN.	0.5500E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4800E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.6500E 01				
PART.CYC.DP,H2O	0.5200E 01				
#1 ORIF.ST,HG	-0.7000E 00				
#1 ORIF.DP,H2O	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.1800E 01	FBA INLET ST,HG	0.0
ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
		FBA DP,H2O	0.0
		FBA DEMIST.DP,H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1400E 03	TEMP.THERMOMETERS,F	0.1420E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.8730E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1440E 03	PART.FINAL,GAL	0.9070E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1380E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.9600E 04
PART.CYC.SUMP	0.1390E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.9676E 04
ABS CYC.SUMP	0.1370E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6000E 02
FBA SUM.	0.0	MGOH2 TANK	0.1340E 03	MGO ROTO.SCALE,%	0.2650E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2650E 02
MGOH2 TANK	0.1350E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-120

DATE 4-1-70

TIME OF DAY 1530

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	504.	110.0	---	---	---	---	0.008	54.1	500.	19.0
SECONDARY AIR	4612.	637.5	---	---	---	---	0.006	49.4	4582.	9.0
FURNACE EXIT	5505.	800.0	3239.9	---	---	---	0.047	110.3	5256.	6.0
PART.SCRB.INLET	5505.	690.0	---	---	---	---	0.047	110.3	---	2.7
PART.CYC.EXIT	5515.	142.0	3264.3	---	---	---	0.142	144.1	4831.	-9.5
VENT ABS.INLET	5515.	142.0	---	---	---	---	0.142	144.1	---	-13.7
ABS CYC.EXIT	5950.	142.0	---	---	---	---	0.127	139.2	---	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5950.	136.0	589.3	*****	*****	*****	0.127	139.2	5279.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.67	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	144.0	5.09	MAKEUP MGO SL.	60.0 10.6	*****
PRODUCT LIQ.	144.0	23.15	PRODUCT LIQ.	135.0 3.8	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	138.0 18.1	*****
			REC.(FLOW NOZ.)	138.0 0.0	*****
				431.3	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.517E 07
% FUEL AS COAL	96.2
COAL FLOW RATE,#/HR	408.7
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	19.5
OXYGEN,% DRY, MEAS.	4.10
CO2,% DRY-CALC.	14.51
HUMIDITY,#/# - CALC.	0.047

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	109.0
SULFITE/SO2-MOL/MOL	=	3.74
SUMP RESID.TIME,MIN	=	7.3

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-0.75
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	152.6
LIQ/GAS,GAL/MCF	15.3
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.5

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0185
MOL% TOTAL SULF=	2.59
O2 AT FURN.EX.=	4.10
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

VENT ABS.

81.95

80.3
30.7
4.3
1.8

PART.

-0.75

152.6
15.3
2.1
6.5

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-0.75
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	152.6
LIQ/GAS,GAL/MCF	15.3
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.5

HEAT RELEASE,BTU/HR

0.517E 07
96.2
408.7
8.9
19.5
4.10
14.51
0.047

% FUEL AS COAL

96.2
408.7
8.9
19.5
4.10
14.51
0.047

COAL FLOW RATE,#/HR

408.7
8.9
19.5
4.10
14.51
0.047

NAT.GAS FLOW,#/HR

8.9
19.5
4.10
14.51
0.047

% EXCESS AIR

19.5
4.10
14.51
0.047

OXYGEN,% DRY, MEAS.

4.10
14.51
0.047

CO2,% DRY-CALC.

14.51
0.047

HUMIDITY,#/# - CALC.

0.047

TIME OF DAY 1530

40

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-121	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST,H2O	0.1050E 02	N.G. FLOW,%SCALE	0.9800E 02
TIME	1700	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8200E 01
PRI.AIR ST, HG	0.1400E 01	FURN. ST,H2O	0.6000E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2100E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.4000E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.6000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2872E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1200E 03	PART.SCRUB.IN	0.6900E 03
ABS NOZ.,PSIG	0.0	WINDBOX-TOP	0.6500E 03	#1 ORIFICE	0.1600E 03
ABS LOAD,PSIG	0.4100E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF.INCH	0.5000E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6400E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.1080E 04	PRI.AIR FAN IN.	0.7400E 02
		NO.2 BANK OUT	0.9700E 03	PRI.AIR WGT BULB	0.5700E 02
CARD NUMBER	7	FURN. EXIT	0.8000E 03	SEC.AIR FAN IN.	0.5200E 02
MODE OF OPER.	2	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4700E 02
PART.SCR.ST,HG	0.2000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.6500E 01	VENT.ABS.DP,H2O	0.1800E 01	FBA INLET ST,HG	0.0
PART.CYC.DP,H2O	0.5400E 01	ABS CYC.DP,H2O	0.4800E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.ST,HG	-0.6000E 00			FBA DP,H2O	0.0
#1 ORIF.DP,H2O	0.4200E 01			FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1410E 03	PART.INIT.GAL	0.9070E 04
FBA INLET	0.0	ABS CYC.EXIT	0.1410E 03	PART.FINAL,GAL	0.9352E 04
FBA EXIT	0.0	PART.CYC.SUMP	0.1430E 03	PART.TIME,MIN	0.4086E 02
P.P.EXIT	0.1360E 03	ABS CYC.SUMP	0.1390E 03	ABS H2O IN.GAL	0.9676E 04
PART.CYC.SUMP	0.1380E 03	FBA SUMP	0.0	ABS H2O FI.GAL	0.9722E 04
ABS CYC.SUMP	0.1370E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.4086E 02
FBA SUMP	0.0	MGOH2 TANK	0.1260E 03	MGO ROTO.SCALE,%	0.2500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2500E 02
MGOH2 TANK	0.1240E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-121

DATE 4-1-70

TIME OF DAY 1700

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	468.	110.0	-----	-----	-----	-----	0.007	51.4	465.	19.0
SECONDARY AIR	4684.	637.5	-----	-----	-----	-----	0.007	50.0	4653.	10.5
FURNACE EXIT	5547.	800.0	3223.2	-----	-----	-----	0.048	110.1	5295.	6.0
PART-SCRB.INLET	5547.	690.0	-----	-----	-----	-----	0.048	110.1	-----	2.7
PART-CYC.EXIT	5485.	141.0	3349.9	-----	-----	-----	0.149	145.4	4773.	-8.1
VENT ABS.INLET	5485.	141.0	-----	-----	-----	-----	0.149	145.4	-----	-12.3
ABS CYC.EXIT	5903.	141.0	-----	-----	-----	-----	0.133	140.1	-----	-24.4
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5903.	136.0	573.4	*****	*****	*****	0.133	140.1	5211.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA	TEMP,F	FLOW,#/M
PARTICULATE	60.0	6.91	MAKEUP WATER	60.0	9.4	*****	*****
MAKEUP WATER	143.0	5.09	MAKEUP MGO SL.	124.0	3.7	*****	*****
PRODUCT LIQ.	143.0	23.15	PRODUCT LIQ.	139.0	18.1	*****	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	139.0	0.0	*****	*****
			REC.(FLOW NOZ.)		465.1	*****	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.524E 07
% FUEL AS COAL	96.3
COAL FLOW RATE,#/HR	414.3
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	19.0
OXYGEN,% DRY, MEAS.	4.00
CO2,% DRY-CALC.	14.60
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-3.93
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	153.4
LIQ/GAS,GAL/MCF	15.2
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.5

VENT ABS.

82.88

80.8
32.9
4.7
1.8

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2,	=	110.9
SULFITE/SO2-MOL/MOL	=	7.65
SUMP RESID.TIME,MIN	=	7.3

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0208
MOL% TOTAL SULF=	2.84
O2 AT FURN.EX.=	4.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-121

DATE 4-1-70

TIME OF DAY 1700

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	15.33			30.66	233.1	5288.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	17.85			*****	252.2	5295.	CARBON 0.455251
							HYDROGEN 0.508596
PART. SCRUBBER							OXYGEN 1.395634
INPUT, #/HR	17.85			*****	3712.	5295.	NITROGEN 5.066885
OUTPUT, #/HR	16.72			*****	3260.	4773.	SULFUR 0.008644
							FEED RATE, #/SEC = 1.54
SO2 ABSORBERS							ENTHALPY, BTU/# = -429.
INPUT, #/HR	16.72	12.85	*****		1475.	4773.	
OUTPUT, #/HR	30.43	21.03	*****		1679.	5211.	

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2 /	GM-MOLE /	GRAM /
COMBINED	100ML	LITER	100ML
FREE	4.90	0.7651	-----
	4.90	0.7651	-----
	0.0	0.0	-----
MONO(TOTAL)	4.90	0.7651	-----
MONO(DISSOLVED)	1.00	0.1562	1.625
MONO(SOLID)	3.90	0.6089	12.908
BISULFITE	0.36	0.0281	0.523
MGO	0.13	0.0201	0.081
SULFATE	0.13	0.0208	0.249
MAGNESIUM	5.16	0.8060	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	*****

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.70
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.60
SP.GRAVITY, HYDROM. = 1.0320

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	I-122 4-1-70 1925	CARD NUMBER WINDBOX ST,H2O BURNER DP,H2O FURN. ST,H2O PP EXIT ST,HG PP EXIT DP,H2O FURN-EX,ST,H2O PEEPSITE DP,HG P-SITE ST,PSIG	0.1040E 02 0.4600E 01 0.5600E 01 -0.1900E 01 0.4800E 01 0.5700E 01 0.0 0.0	CARD NUMBER N.G. FLOW,%SCALE N.G. STATIC,R.O. SCREW SPEED,RPM O2 FURN-EX,%-BM COMB.FURN,EX,% ELE.CHEM.MILVOLT CELL TEMP,F BAROMETRIC,HG	0.9350E 02 0.8400E 01 0.3650E 03 0.4800E 01 0.0 0.0 0.0 0.2866E 02
CARD NUMBER PART.NOZ.,PSIG PART.LOAD,PSIG ABS NOZ.,PSIG ABS LOAD,PSIG ABS ORIF,INCH ABSORBER NOZ. CODE MANOMETER CODE	4 02 02 01 02 01 6 0	CARD NUMBER TEMP.FURN.RECORDER,F SEC.AIR ORIF. WINDBOX-TOP WINDBOX-WEST WINDBOX-BOT. WINDBOX-EAST NO.1 BANK OUT NO.2 BANK OUT FURN. EXIT COAL-AIR	5 03 03 03 03 03 04 03 03 03 03	CARD NUMBER TEMP.CONTINUED PART.SCRUB.IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI.AIR FAN IN. PRI.AIR WGT BULB SEC.AIR FAN IN. SEC.AIR WET BULB	6 03 03 0.0 0.7000E 03 0.7000E 03 0.7350E 02 0.5800E 02 0.4800E 02 0.4650E 02
CARD NUMBER MODE OF OPER. PART.SCR.ST,HG PART.SCR.DP,H2O PART.CYC.DP,H2O #1 ORIF.ST,HG #1 ORIF.DP,H2O	7 2 00 01 00 01	CARD NUMBER VENT.ABS.DP,H2O ABS CYC.DP,H2O	8 01 01	CARD NUMBER FBA INLET ST,HG FBA SUMP DP,H2O FBA DP,H2O FBA DEMIST.DP,H2O	9 0.0 0.0 0.0 0.0
CARD NUMBER TEMP.PILOT RECORDER,F #1 ORIFICE FBA INLET FBA EXIT P.P.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 03 03 03 03 03 03 03 03 03 03 02	CARD NUMBER TEMP.THERMOMETERS,F PART.CYC.EXIT ABS CYC.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 03 03 03 03 03 03 03	CARD NUMBER MAKEUP FLOWS PART.INIT.GAL PART.FINAL,GAL PART.TIME,MIN ABS H2O IN,GAL ABS H2O FI,GAL ABS H2O TIME,MIN MGO ROTO.SCALE,% MAKEUP SETTING	12 04 04 02 04 04 02 02 02 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-122		DATE 4-1-70		TIME OF DAY 1925			
MATERIAL BALANCES							
FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR		14.52	-----	29.04	225.5	5244.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR		17.81	-----	*****	243.6	5251.	CARBON 0.435760
PART. SCRUBBER							HYDROGEN 0.497947
INPUT, #/HR		17.81	-----	*****	3316.	5251.	OXYGEN 1.397955
OUTPUT, #/HR		15.95	-----	*****	3241.	4772.	NITROGEN 5.084818
SO2 ABSORBERS							SULFUR 0.008273
INPUT, #/HR		15.95	12.85	*****	1589.	4772.	FEED RATE, #/SEC= 1.52
OUTPUT, #/HR		29.82	20.29	*****	1588.	5086.	ENTHALPY, BTU/# = -353.
*SO2 ABSORBERS-PRODUCT COMP.		GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION		
TOTAL,		5.07	0.7929	-----	SLURRY CONC.- GM MGO/100ML = 9.70		
COMBINED		5.07	0.7929	-----	MGO PRESLAKED, NO=0, YES=1		
FREE		0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****		
MONO(TOTAL)		5.07	0.7929	-----	PRODUCT MG BASE PHYSICAL PROPERTIES		
MONO(DISSOLVED)		1.10	0.1719	-----	ACID STRENGTH, PH = *****		
MONO(SOLID)		3.97	0.6211	1.787	SP.GRAVITY, HYDROM. = *****		
BISULFITE		0.36	0.0281	13.167			
MGO		0.13	0.0202	0.523			
SULFATE		0.12	0.0180	0.081			
MAGNESIUM		5.32	0.8311	0.216			
FLYASH		-----	-----	-----	PARTICULATE SCRUBBER PRODUCT		
SOLIDS, MG		-----	-----	*****	ACID STRENGTH, PH = *****		
				*****	FLYASH CONC. GM/100ML = *****		

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-123				
DATE	4-1-70				
TIME	2045				
PRI.AIR ST, HG	0.1300E 01				
PRI.AIR DP,H20	0.2300E 01				
SEC.AIR ST,HG	0.1500E 01				
SEC.AIR DP,H20	0.2100E 01				
		CARD NUMBER			
		WINDBOX ST,H20	0.0		
		BURNER DP,H20	0.4700E 01		
		FURN. ST,H20	0.6300E 01		
		PP EXIT ST,HG	-0.1900E 01		
		PP EXIT DP,H20	0.4900E 01		
		FURN.EX.ST,H20	0.6400E 01		
		PEEPSITE DP,HG	0.0		
		P.SITE ST,PSIG	0.0		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.THERMOMETERS,F			
		PART.CYC.EXIT	0.1440E 03		
		ABS CYC.EXIT	0.1440E 03		
		PART.CYC.SUMP	0.1460E 03		
		ABS CYC.SUMP	0.1420E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1120E 03		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT	0.1400E 03		
		PART.CYC.SUMP	0.1410E 03		
		ABS CYC.SUMP	0.1400E 03		
		FBA SUMP	0.0		
		MGO SLAK TANK	0.0		
		MGOH2 TANK	0.1130E 03		
		MAKEUP WATER	0.5750E 02		
		CARD NUMBER			
		TEMP.FURN.RECORDER,F			
		SEC.AIR ORIF.	0.1100E 03		
		WINDBOX-TOP	0.6600E 03		
		WINDBOX-WEST	0.6300E 03		
		WINDBOX-BOT.	0.6300E 03		
		WINDBOX-EAST	0.6480E 03		
		NO.1 BANK OUT	0.1075E 04		
		NO.2 BANK OUT	0.8800E 03		
		FURN. EXIT	0.7850E 03		
		COAL-AIR	0.1200E 03		
		CARD NUMBER			
		VENT.ABS.DP,H20	0.1700E 01		
		ABS CYC.DP,H20	0.5000E 01		
		CARD NUMBER			
		TEMP.PILOT RECORDER,F			
		#1 ORIFICE	0.1435E 03		
		FBA INLET	0.0		
		FBA EXIT	0.0		
		P.P.EXIT			

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-123

DATE 4-1-70

TIME OF DAY 2045

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	484.	120.0	---	---	---	---	0.009	59.7	479.	17.6
SECONDARY AIR	4620.	642.0	---	---	---	---	0.007	52.6	4587.	0.0
FURNACE EXIT	5497.	785.0	3038.2	---	---	---	0.049	110.6	5243.	6.4
PART.SCRB.INLET	5497.	710.0	---	---	---	---	0.049	110.6	---	3.4
PART.CYC.EXIT	5464.	144.0	2936.4	---	---	---	0.145	144.4	4771.	-8.1
VENT ABS.INLET	5464.	144.0	---	---	---	---	0.145	144.4	---	-12.3
ABS CYC.EXIT	5803.	144.0	---	---	---	---	0.130	139.2	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT DRIF.	5803.	140.0	1567.2	*****	*****	*****	0.130	139.2	5134.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	57.5	5.66	57.5	9.1	*****
MAKEUP WATER	146.0	5.09	MAKEUP MGO SL.	3.6	*****
PRODUCT LIQ.	146.0	23.15	PRODUCT LIQ.	16.3	*****
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	199.2	*****
			REC.(FLOW NOZ.)	460.4	*****

FURNACE PERFORMANCE

	HEAT RELEASE,BTU/HR	% FUEL AS COAL	COAL FLOW RATE,#/HR	NAT.GAS FLOW,#/HR	% EXCESS AIR	OXYGEN,% DRY,MEAS.	CO2,% DRY-CALC.	HUMIDITY,#/# - CALC.	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
	0.521E 07	96.4	413.0	8.4	18.6	3.90	14.70	0.049	SO2 ABSORB.EFF	3.35	46.63	*****
									FLYASH COL.EFF	*****	*****	*****
									SO3 ABSORB.EFF	*****	*****	*****
									NOX ABSORB.EFF	*****	*****	*****
									GAS VELOCITY,FPS	154.0	80.4	*****
									LIQ/GAS,GAL/MCF	15.2	32.7	*****
									LIQ/GAS,#/#	2.1	4.8	*****
									PRES.DROP,IN.WG	6.5	1.7	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2, = 38.9
 SULFITE/SO2-MOL/MOL = 10.00
 SUMP RESID.TIME,MIN = 9.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2 = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0134
 MOL% TOTAL SULF= 1.87
 O2 AT FURN.EX.= 3.90
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-123

DATE 4-1-70

TIME OF DAY 2045

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	15.28			30.57	236.4	5235.	
OUTPUT, #/HR	16.65			*****	254.5	5243.	
PART. SCRUBBER							
INPUT, #/HR	16.65			*****	3087.	5243.	
OUTPUT, #/HR	14.65			*****	3241.	4771.	
SO2 ABSORBERS							
INPUT, #/HR	14.65		*****	*****	1456.	4771.	
OUTPUT, #/HR	32.18		17.08	*****	1567.	5134.	

* * SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	4.77	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	4.56	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = *****
FREE	0.21				MGO PRESLAKED, NO=0, YES=1 *****
MONO(TOTAL)	4.35				% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	1.14				
MONO(SOLID)	3.21			1.852	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	0.56			10.629	ACID STRENGTH, PH = 6.60
MGO	0.0			0.814	SP.GRAVITY, HYDROM. = 1.0400
SULFATE	0.09			0.0	
MAGNESIUM	4.65			0.161	PARTICULATE SCRUBBER PRODUCT
FLYASH				*****	ACID STRENGTH, PH = *****
SOLIDS, MG				*****	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* * SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	1-124	CARD NUMBER	2	CARD NUMBER	3
DATE	4-1-70	WINDBOX ST, H2O	0.1120E 02	N.G. FLOW, WSCALE	0.9400E 02
TIME	2215	BURNER DP, H2O	0.4800E 01	N.G. STATIC, R.O.	0.8300E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.6500E 01	SCREW SPEED, RPM	0.3600E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. 3-BM	0.4900E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4900E 01	CUMUL. FURN. EX. 3	0.0
SEC. AIR DP, H2O	0.2100E 01	FURN. EX. ST, H2O	0.6500E 01	ELE. CHEM. MILVULT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2850E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1100E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.6580E 03	PART. SCRUB. IN	0.7150E 03
ABS NOZ., PSIG	0.6500E 01	WINDBOX-TOP	0.6300E 03	#1 ORIFICE	0.1700E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-NEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4900E 01	WINDBOX-BOT.	0.6450E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.1100E 04	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.9950E 03	PRI. AIR FAN IN.	0.7050E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7950E 03	PRI. AIR WGT BULB	0.6000E 02
MODE CF OPER.	2	FURN. EXIT	0.1200E 03	SEC. AIR FAN IN.	0.4600E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR		SEC. AIR WET BULB	0.4600E 02
PART. SCR. DP, H2O	0.3800E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5800E 01	VENT. ABS. DP, H2O	0.1800E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.5000E 00	ABS CYC. DP, H2O	0.5100E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4300E 01			FBA DP, H2O	0.0
				FBA DENIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1670E 03	TEMP. THERMOMETERS, F	0.1680E 03	MAKUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1460E 03	PART. INIT. GAL	0.6323E 04
FBA INLET	0.0	ABS CYC. EXIT	0.1440E 03	PART. FINAL, GAL	0.6821E 04
FBA EXIT	0.0	PART. CYC. SUMP	0.1420E 03	PART. TIME, MIN	0.9467E 02
P.P. EXIT	0.1410E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.8926E 04
PART. CYC. SUMP	0.1400E 03	FBA SUMP	0.1820E 02	ABS H2O FI. GAL	0.9007E 04
ABS CYC. SUMP	0.1400E 03	MGO SLAK TANK	0.1060E 03	ABS H2O TIME, MIN	0.9467E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTU. SCALE, %	0.2500E 02
MGO SLAK TANK	0.1720E 03			MAKEUP SETTING	0.2500E 02
MGOH2 TANK	0.1080E 03				
MAKEUP WATER	0.5750E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER 1-124

DATE 4-1-70

TIME OF DAY 2215

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PPUG.	
INPUT, #/HR	14.35	-----	-----	28.70	225.0	5217.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	17.82	-----	-----	*****	243.2	5223.	CARBON	0.433240
							HYDROGEN	0.515281
							OXYGEN	1.398239
							NITROGEN	5.087140
							SULFUR	0.008223

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

17.82
14.78

2873.
3206.

5223.
4769.

FEED RATE, #/SEC= 1.52

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

14.78
38.47

1288.
1510.

4769.
5130.

ENTHALPY, BTU/# = -338.

*

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.30
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
RISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

7.05
6.94
0.11
6.83
1.10
5.73
0.44
0.0
0.25
7.18

1.1014
1.0841
0.0173
1.0668
0.1719
0.8949
0.0344
0.0
0.0383
1.1224

1.787
18.971
0.639
0.0
0.460

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	1-125	CARD NUMBER	2
DATE	4-1-70	WINDBOX ST, H2O	0.1030E 02
TIME	2355	BURNER DP, H2O	0.4800E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.6100E 01
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4900E 01
SEC. AIR DP, H2O	0.2100E 01	FURN. EX. ST, H2O	0.6100E 01
		PPEPSITE DP, HG	0.0
		P. SITE ST, PSIG	0.0

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1150E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR CRIF.	0.5600E 03	PART. SCRUB. IN	
ABS NOZ., PSIG	0.6500E 01	WINDBOX-TOP	0.6300E 03	#1 DRIFICE	0.7050E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FRA INLET	0.1550E 03
ABS CRIF. INCH	0.5000E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.0
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK CUT	0.1135E 04	PRI. AIR FAN IN.	0.7000E 03
		NO.2 BANK OUT	0.1035E 04	PRI. AIR WGT BULB	0.6900E 02
CARD NUMBER	7	FURN. EXIT	0.8200E 03	SEC. AIR FAN IN.	0.6000E 02
MCDE CF DPER.	2	COAL-AIR	0.1200E 03	SEC. AIR FAN IN.	0.4600E 02
PART. SCR. ST, HG	0.2500E 00			SEC. AIR WET BULB	0.4600E 02
PART. SCR. DP, H2O	0.6500E 01				
PART. CYC. DP, H2O	0.5400E 01				
#1 CRIF. ST, HG	-0.7000E 00				
#1 CRIF. DP, H2O	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.1700E 01	FBA INLET ST, HG	0.0
ABS CYC. DP, H2O	0.4900E 01	FBA SUMP DP, H2O	0.0
		FBA DP, H2O	0.0
		FBA GENIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1410E 03	TEMP. THERMOMETERS, F	0.1410E 03	MAKEUP FLOWS	
#1 CRIFICE	0.0	PART. CYC. EXIT	0.1410E 03	PART. INIT. GAL	0.8831E 04
FBA INLET	0.0	ABS CYC. EXIT	0.1410E 03	PART. FINAL, GAL	0.9331E 04
FBA EXIT	0.0	PART. CYC. SUMP	0.1420E 03	PART. TIME, MIN	0.9149E 02
P. P. EXIT	0.1370E 03	ABS CYC. SUMP	0.1400E 03	ABS H2O IN. GAL	0.1008E 04
PART. CYC. SUMP	0.1380E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1074E 04
ABS CYC. SUMP	0.1370E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.9149E 02
FBA SUMP	0.0	MGOH2 TANK	0.1280E 03	MGO ROTO. SCALE, %	0.2400E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2400E 02
MGOH2 TANK	0.1280E 03				
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER 1-125

DATE 4-1-70

TIME OF DAY 2355

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR
15.19
17.05

MAGNESIUM

FLYASH
30.37

WATER
235.8
254.1

DRY GAS
5204.
5212.

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

17.05
13.08

2989.
3243.

5212.
4763.

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

13.08
42.03

29.88

1269.
1513.

4763.
5141.

*

#SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE
MUNCI(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML

7.90
7.90
0.0
7.90
1.26
6.64
0.0
0.16
0.07
8.13

GM-MOLE/
LITER

1.2342
1.2342
0.0
1.2342
0.1969
1.0373
0.0
0.0246
0.0115
1.2703

GRAM/
100ML

2.047
21.991
0.0
0.098
0.138

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MGO BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. G/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

#SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #AIBMS/100#FEED

CARBON 0.457840
HYDROGEN 0.540248
OXYGEN 1.395362
NITROGEN 5.064493
SULFUR 0.008699

FEED RATE, #/SEC= 1.52

ENTHALPY, BTU/# = -920.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-126	CARD NUMBER	2	CARD NUMBER	3
DATE	4-2-70	WINDBOX ST, H2O	0.1080E 02	N.G. FLOW, %SCALE	0.9400E 02
TIME	0115	BURNER DP, H2O	0.4900E 01	N.G. STATIC, R.O.	0.8300E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.6400E 01	SCREW SPEED, RPM	0.3600E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1900E 01	G2 FURN. EX. %BM	0.6000E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4800E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2100E 01	FURN. EX. ST, H2O	0.4000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2841E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.1150E 03	PART. SCRUB. IN	0.6000E 03
ABS NOZ., PSIG	0.6500E 01	WINDBOX-TOP	0.6600E 03	#1 CRIFICE	0.1550E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.5100E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6450E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO. 1 BANK CUT	0.9350E 03	PRI. AIR FAN IN.	0.7400E 02
		NO. 2 BANK CUT	0.8350E 03	PRI. AIR WGT BULB	0.6300E 02
CARD NUMBER	7	FURN. EXIT	0.7300E 03	SEC. AIR FAN IN.	0.5000E 02
MODE OF OPER.	2	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.5000E 02
PART. SCR. ST, HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.6500E 01	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.5200E 01	ABS CYC. DP, H2O	0.4500E 01	FBA SUNP DP, H2O	0.0
#1 ORIF. ST, HG	-0.7000E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.4100E 01			FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 CRIFICE	0.1370E 03	PART. CYC. EXIT	0.1370E 03	PART. INIT. GAL	0.1135E 05
FBA INLET	0.0	ABS CYC. EXIT	0.1370E 03	PART. FINAL, GAL	0.1190E 05
FBA EXIT	0.0	PART. CYC. SUMP	0.1390E 03	PART. TIME, MIN	0.1030E 03
P. P. EXIT	0.1320E 03	ABS CYC. SUMP	0.1360E 03	ABS H2O IN. GAL	0.1076E 04
PART. CYC. SUMP	0.1340E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1187E 04
ABS CYC. SUMP	0.1330E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.1030E 03
FBA SUMP	0.0	MGOH2 TANK	0.1260E 03	MGO RUTO. SCALE, %	0.2600E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2600E 02
MGOH2 TANK	0.1240E 03				
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-126

DATE 4-2-70

TIME OF DAY 0115

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	482.	120.0	---	---	---	---	0.011	63.4	477.	17.6
SECONDARY AIR	4585.	641.3	---	---	---	---	0.009	57.2	4546.	10.8
FURNACE EXIT	5410.	730.0	3333.0	---	---	---	0.045	107.7	5175.	4.0
PART.SCRB.INLET	5410.	600.0	---	---	---	---	0.045	107.7	---	1.4
PART.CYC.EXIT	5423.	137.0	2756.0	---	---	---	0.119	137.5	4846.	-9.5
VENT ABS.INLET	5423.	137.0	---	---	---	---	0.119	137.5	---	-13.6
ABS CYC.EXIT	5782.	137.0	---	---	---	---	0.106	132.2	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
P.P. EXIT ORIF.	5782.	132.0	543.8	*****	*****	*****	0.106	132.2	5228.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FRA TEMP,F FLOW,#/M
PARTICULATE	58.0	5.39	---	58.0	---
MAKEUP WATER	139.0	5.09	---	124.0	---
PRODUCT LIQ.	139.0	23.15	---	136.0	---
RECIRCULATED LIQ.	---	---	---	136.0	---
	---	---	---	199.2	---
	---	---	---	469.7	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.455E 07
% FUEL AS COAL	95.9
COAL FLOW RATE,#/HR	358.3
NAT.GAS FLOW,#/HR	8.4
% EXCESS AIR	28.6
OXYGEN,% DRY, MEAS.	6.00
CO2,% DRY-CALC.	12.86
HUMIDITY,#/# - CALC.	0.045

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	103.0
SULFITE/SC2-MOL/MUL	=	7.44
SUMP RESID.TIME,MIN	=	9.1

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SU2 ABSORB.EFF	17.31
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	151.5
LIQ/GAS,GAL/MCF	15.4
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.5

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	*****
SULFITE/SD2-MOL/MCL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L	=	0.0217
MOL% TOTAL SULF	=	2.92
O2 AT FURN.EX	=	6.00
U2 AT ABSORB.IN	=	*****
U2 AT ABSORB.EX	=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-126

DATE 4-2-70

TIME OF DAY 0115

MATERIAL BALANCES

SULFUR FLYASH WATER DRY GAS

FURNACE

INPUT, #/HR 13.26
OUTPUT, #/HR 18.16

MAGNESIUM 26.52
FLYASH 234.7

WATER 216.6
DRY GAS 5169.
5175.

PART. SCRUBBER

INPUT, #/HR 18.16
OUTPUT, #/HR 14.07

MAGNESIUM
FLYASH

WATER 2931.
DRY GAS 5175.
4846.

SO2 ABSORBERS

INPUT, #/HR 14.07
OUTPUT, #/HR 28.08

MAGNESIUM
FLYASH

WATER 1346.
DRY GAS 4846.
5220.

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 4.99
COMBINED 4.99
FREE 0.0
MONO(TOTAL) 4.99
MONO(DISSOLVED) 0.80
MONO(SOLID) 4.19
BISULFITE 0.40
MGU 0.17
SULFATE 0.14
MAGNESIUM 5.30
FLYASH
SOLIDS, MG

GM SO2/
100ML

0.7794
0.7794
0.0
0.7794
0.1250
0.6544
0.0313
0.0270
0.0217
0.8281

MAKEDUP AND COMPOSITION

SLURRY CONC. - GM MGU/100ML =
MGU PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, NEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.20
SP. GRAVITY, HYDROM. = 1.0320

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =
FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PRC.

INPUT FLOWS, #ATCHS/100#FEED

CARBON 0.405758
HYDROGEN 0.504134
OXYGEN 1.401439
NITROGEN 5.112447
SULFUR 0.007687

FEED RATE, #/SEC= 1.50

ENTHALPY, BTU/# = -278.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	I-127 4-2-70 0245	CARD NUMBER	2	CARD NUMBER	3
PRI-AIR ST, HG	0.1300E 01	WINDBOX ST, H2O	0.1140E 02	N.G. FLOW, YSCALE	0.0350E 02
PRI-AIR DP, H2O	0.2300E 01	BURNER DP, H2O	0.4900E 01	N.G. STATIC, R.O.	0.8400E 01
SEC-AIR ST, HG	0.1500E 01	FURN. ST, H2O	0.6600E 01	SCREW SPEED, RPM	0.3600E 03
SEC-AIR DP, H2O	0.2100E 01	PP EXIT ST, HG	-0.1900E 01	U2 FURN. EX. % - BM	0.4000E 01
		PP EXIT DP, H2O	0.4900E 01	COMB. FURN. EX. %	0.0
		FURN. EX. ST, H2O	0.3800E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2826E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1180E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.6600E 03	PART. SCRUB. IN	0.5500E 03
ABS NOZ., PSIG	0.6500E 01	WINDBOX-TOP	0.6300E 03	#1 URIFICE	0.1500E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-WEST	0.6300E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4900E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6500E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8200E 03	PRI. AIR FAN IN.	0.6900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7900E 03	PRI. AIR WGT BULB	0.6000E 02
MODE OF OPER.	2	FURN. EXIT	0.6500E 03	SEC. AIR FAN IN.	0.5300E 02
PART. SCR. ST, HG	0.1000E 00	COAL-AIR	0.1150E 03	SEC. AIR WET BULB	0.5300E 02
PART. SCR. DP, H2O	0.6600E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5300E 01	VENT. ABS. DP, H2O	0.1600E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.7000E 00	ABS CYC. DP, H2O	0.4900E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4100E 01			FBA DP, H2O	0.0
				FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1330E 03	TEMP. THERMOMETERS, F	0.1340E 03	MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1340E 03	PART. INIT. GAL	0.1910E 04
FBA INLET	0.0	ABS CYC. EXIT	0.1360E 03	PART. FINAL, GAL	0.2230E 04
FBA EXIT	0.0	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.6450E 02
P.P. EXIT	0.1290E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1895E 03
PART. CYC. SUMP	0.1300E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.2626E 03
ABS CYC. SUMP	0.1290E 03	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.6450E 02
FBA SUMP	0.0	MGOH2 TANK	0.0	MGO ROTO. SCALE, %	0.2700E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2700E 02
MGOH2 TANK	0.1210E 03				
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER I-127

DATE 4-2-70

TIME OF DAY 0245

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	483.	115.0	---	---	---	---	0.010	60.9	478.	17.6
SECONDARY AIR	4561.	642.5	---	---	---	---	0.010	60.2	4517.	11.4
FURNACE EXIT	5429.	650.0	3860.9	---	---	---	0.050	111.2	5168.	3.8
PART.SCRB.INLET	5429.	550.0	---	---	---	---	0.050	111.2	---	1.4
PART.CYC.EXIT	5440.	134.0	3253.2	---	---	---	0.117	137.0	4870.	-9.5
VENT ABS.INLET	5440.	134.0	---	---	---	---	0.117	137.0	---	-13.6
ABS CYC.EXIT	5860.	134.0	---	---	---	---	0.105	131.9	---	-25.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT ORIF.	5860.	129.0	811.2	*****	*****	*****	0.105	131.9	5302.	-25.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER TEMP,F FLOW,#/M	VENTURI ABSORBER TEMP,F FLOW,#/M	FRA TEMP,F FLOW,#/M
PARTICULATE	58.0	5.74	58.0	9.5	*****
MAKEUP WATER	136.0	5.09	121.0	3.8	*****
PRODUCT LIQ.	136.0	23.15	132.0	16.3	*****
RECIRCULATED LIQ.			132.0	199.2	*****
			REC.(FLOW NOZ.)	460.4	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.511E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	404.7
NAT.GAS FLOW,#/HR	8.4
% EXCESS AIR	19.0
OXYGEN,DRY,MEAS.	4.00
CO2,DRY-CALC.	14.61
HUMIDITY,#/# - CALC.	0.050

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	15.48
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	151.0
LIQ/GAS,GAL/MCF	15.5
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	6.6

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	89.0
SULFITE/SO2-MOL/MOL	=	7.49
SUMP RESID.TIME,MIN	=	9.1

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	
SULFITE/SC2-MOL/MOL	=	
SUMP RESID.TIME,MIN	=	

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0288
MOL% TOTAL SULF=	3.56
O2 AT FURN.EX.=	4.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER I-127

DATE 4-2-70

TIME OF DAY 0245

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	14.98			29.95	242.9	5161.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	20.87			*****	260.9	5168.	CARBON 0.455419
							HYDROGEN 0.538888
							OXYGEN 1.395649
							NITROGEN 5.066721
							SULFUR 0.008653

FEED RATE, #/SEC= 1.50

ENTHALPY, BTU/# = -1901.

MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML = 9.80
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = *****
 SP.GRAVITY, HYDRON. = *****

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

*SU2 ABSORBERS- PRODUCT COMP.	GM SU2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	5.40	0.8444	-----
COMBINED	5.21	0.8141	-----
FREE	0.19	0.0303	-----
MONO(TOTAL)	5.02	0.7838	-----
MONO(DISSOLVED)	0.98	0.1531	1.592
MONO(SOLID)	4.04	0.6307	13.371
BISULFITE	0.40	0.0313	0.581
MGO	0.0	0.0	0.0
SULFATE	0.18	0.0288	0.346
MAGNESIUM	5.39	0.8430	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	I-128	CARD NUMBER	2	CARD NUMBER	3
DATE	4-2-70	WINDBOX ST, H2O	0.1120E 02	N.G. FLOW, ESCALE	0.9400E 02
TIME	0435	BURNER DP, H2O	0.5000E 01	N.G. STATIC, R.O.	0.8300E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.6100E 01	SCREEN SPEED, RPM	0.3700E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1900E 01	02 FURN. EX. % - BM	0.6200E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4700E 01	COHB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2100E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2819E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.1180E 03	PART. SCRUB. IN	0.4900E 03
ABS NOZ., PSIG	0.6500E 01	WINDBOX-TOP	0.6550E 03	#1 ORIFICE	0.1450E 03
ABS LOAD, PSIG	0.4200E 02	WINDBOX-WEST	0.6250E 03	FBA INLET	0.0
ABS ORIF. INCH	0.4700E 01	WINDBOX-BOT.	0.6250E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6420E 03	AIR HEATER #2	0.7000E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6850E 03	PRI. AIR FAN IN.	0.8100E 02
		NO.2 BANK OUT	0.6300E 03	PRI. AIR WGT BULB	0.6700E 02
CARD NUMBER	7	FURN. EXIT	0.5550E 03	SEC. AIR FAN IN.	0.5300E 02
MODE OF OPER.	2	COAL-AIR	0.1120E 03	SEC. AIR SET BULB	0.5300E 02
PART. SCR. ST, HG	-0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.6400E 01	VENT. ABS. DP, H2O	0.1400E 01	FBA INLET ST, HG	0.0
PART. CYC. DP, H2O	0.5100E 01	ABS CYC. DP, H2O	0.4500E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. ST, HG	-0.9500E 00			FBA DP, H2O	0.0
#1 ORIF. DP, H2O	0.4000E 01			FBA DENIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1290E 03	PART. CYC. EXIT	0.1300E 03	PART. INIT. GAL	0.2277E 04
FBA INLET	0.0	ABS CYC. EXIT	0.1300E 03	PART. FINAL, GAL	0.2948E 04
FBA EXIT	0.0	PART. CYC. SUMP	0.1310E 03	PART. TIME, MIN	0.7702E 02
P.P. EXIT	0.1240E 03	ABS CYC. SUMP	0.1270E 03	ABS H2O IN. GAL	0.2640E 03
PART. CYC. SUMP	0.1260E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.3991E 03
ABS CYC. SUMP	0.1240E 03	MGO SLAK TANK	0.1840E 03	ABS H2O TIME, MIN	0.7702E 02
FBA SUMP	0.0	MGOH2 TANK	0.1210E 03	MGO ROTC. SCALE, %	0.2500E 02
MGO SLAK TANK	0.1820E 03			MAKEUP SETTING	0.2500E 02
MGOH2 TANK	0.1180E 03				
MAKEUP WATER	0.5800E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2.

RUN NUMBER 1-128

DATE 4-2-70

TIME OF DAY 0435

MATERIAL BALANCES

FURNACE
INPUT, #/HR 12.96
OUTPUT, #/HR 17.64

PART. SCRUBBER
INPUT, #/HR 17.64
OUTPUT, #/HR 13.42

SO2 ABSORBERS
INPUT, #/HR 13.42
OUTPUT, #/HR 30.94

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 5.13
COMBINED 5.13
FREE 0.0
MONO(TOTAL) 5.13
MONO(DISSOLVED) 0.78
MONO(SOLID) 4.35
BISULFITE 0.08
MGO 0.28
SULFATE 0.17
MAGNESIUM 5.59
FLYASH
SOLIDS, MG

SULFUR 12.96
17.64
17.64
13.42
13.42
30.94

MAGNESIUM 25.92

21.30

FLYASH 217.7
235.8
4600.
3104.
1653.
1473.

WATER 5122.
5127.
5127.
4790.
4790.
5183.

DRY GAS

INPUT FOR EQ. - KIN. PROC.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.400699
HYDROGEN 0.514606
OXYGEN 1.402021
NITROGEN 5.117106
SULFUR 0.007588

FEED RATE, #/SEC= 1.48

ENTHALPY, BTU/# = -826.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP. GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-129	CARD NUMBER	2	CARD NUMBER	3
DATE	4-14-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, & SCALE	0.9800E 02
TIME	1630	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2500E 01	SCRFW SPEED, RPM	0.3700E 03
PRI. AIR DP, H2O	0.2000E 01	PP EXIT ST, HG	-0.1800E 01	O2 FURN. EX. & BM	0.5500E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5000E 01	COMP. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.2400E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2880E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1000E 03	PART. SCRUB. IN	
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.7500E 03	#1 ORIFICE	0.0
ABS LOAD, PSIG	0.2500E 02	WINDBOX-WEST	0.7100E 03	FBA INLET	0.0
ABS ORIF. INCH	0.6200E 01	WINDBOX-BOT.	0.7100E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO. 1 BANK CUT	0.7450E 03	PRI. AIR FAN IN.	0.7500E 02
CARD NUMBER	7	NO. 2 BANK CUT	0.7000E 03	PRI. AIR WGT BULB	0.6100E 02
MODE CF OPER.	4	FURN. EXIT	0.5600E 03	SEC. AIR FAN IN.	0.4400E 02
PART. SCR. ST, HG	0.0	COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.4400E 02
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.7200E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	0.2000E 00	ABS CYC. DP, H2O	0.7800E 01	FBA SUMP DP, H2O	0.0
#1 CRIF. DP, H2O	0.5800E 01	CARD NUMBER	11	FBA DP, H2O	0.0
		TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.0
CARD NUMBER	10	PART. CYC. EXIT	0.0	CARD NUMBER	12
TEMP. PILOT RECORDER, F		ABS CYC. EXIT	0.1360E 03	MAKEUP FLOWS	
#1 ORIFICE	0.9300E 02	PART. CYC. SUMP	0.0	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. SUMP	0.1320E 03	PART. FINAL, GAL	0.0
FBA EXIT	0.0	FBA SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1340E 03	MGO SLAK TANK	0.1760E 03	ABS H2O IN. GAL	0.2183E 05
PART. CYC. SUMP	0.0	MGOH2. TANK	0.1240E 03	ABS H2O I.I. GAL	0.2199E 05
ABS CYC. SUMP	0.1300E 03			ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0			MGO ROT. SCALE, %	0.5400E 02
MGO SLAK TANK	0.1740E 03			MAKEUP SITTING	0.5400E 02
MGOH2 TANK	0.1230E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-129

DATE 4-14-70

TIME OF DAY 1630

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.49			28.98	225.5	5467.
OUTPUT, #/HR	*****	*****	*****	*****	244.5	5474.
PART. SCRUBBER					*****	*****
INPUT, #/HR	*****	*****	*****	*****	*****	*****
OUTPUT, #/HR	*****	*****	*****	*****	*****	*****
SO2 ABSORBERS						
INPUT, #/HR	*****	*****	*****	*****	1900.	5116.
OUTPUT, #/HR	*****	*****	*****	*****	1799.	5293.

INPUT FOR EQ. - KIN. PROC.
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.418325
 HYDROGEN 0.498222
 OXYGEN 1.399982
 NITROGEN 5.100873
 SULFUR 0.007933

FEED RATE, #/SEC= 1.59
 ENTHALPY, BTU/# = 2489.

* SO2 ABSORBERS--
 PRODUCT COMP.
 TOTAL, 2.90
 COMBINED 2.90
 FREE 0.0
 MONO(TOTAL) 2.90
 MONO(DISSOLVED) 0.98
 MONO(SOLID) 1.92
 BISULFITE 0.04
 MGO 0.58
 SULFATE 0.13
 MAGNESIUM 3.62
 FLYASH -----
 SOLIDS, MG -----

MAKEUP MGO COMPOSITION
 SLURRY CONC.- GM MGO/100ML = *****
 MGO PRESLAKED, NU=0, YES=1 0
 % SLAKED TO MG(OH)2, KEAS. = *****

PRODUCT MGO BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = *****
 SP.GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-130	CARD NUMBER	2	CARD NUMBER	3
DATE	4-15-76	WINDBOX ST, H2O	0.9600E 01	N.G. FLOW, SCALE	0.9400E 02
TIME	0001	BURNER DP, H2O	0.5600E 01	N.G. STATIC, R.C.	0.8600E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.4200E 01	SCRUB SPEED, RPM	0.3600E 03
PRI. AIR DP, H2O	0.1800E 01	PP EXIT ST, HG	-0.1600E 01	C2 FURN. EX. R-BM	0.5100E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4800E 01	CUMB. FURN. EX. R	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.3700E 01	ELE. CHEM. MILVOLT	0.0
		PCEPSITE DP, HG	0.0	CILL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2889E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F	0.1050E 03	TENP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR DRIF.	0.7600E 03	PART. SCRUB. IN	0.0
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6700E 03	#1 OFFICE	0.5100E 03
ABS LOAD, PSIG	0.2900E 02	WINDBOX-WEST	0.6700E 03	FBA INLET	0.0
ABS GRIF. INCH	0.5000E 01	WINDBOX-BOT.	0.6700E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6600E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.7700E 03	PRI. AIR FAN IN.	0.7900E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.6400E 03	PRI. AIR WGT BULB	0.6200E 02
MODE CF OPER.	4	FURN. EXIT	0.5350E 03	SEC. AIR FAN IN.	0.4300E 02
PART. SCR. ST, HG	0.0	COAL-AIR	0.1150E 03	SEC. AIR WGT BULB	0.4300E 02
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.9000E 01	FBA INLET ST, HG	0.0
#1 DRIF. ST, HG	0.3000E 00	ABS CYC. DP, H2O	0.8200E 01	FBA SUMP DP, H2O	0.0
#1 DRIF. DP, H2O	0.5000E 01			FBA DP, H2O	0.0
				FBA DENIST. DP, H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.9500E 02	TEMP. THEKNOFTERS, F	0.0	MAKEUP FLOWS	
#1 DRIFICE	0.0	PART. CYC. EXIT	0.1300E 03	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.0	PART. CYC. SUMP	0.1350E 03	PART. TIME, MIN	0.0
P. P. EXIT	0.0	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.2351E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1920E 03	ABS H2O FI. GAL	0.2351E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1230E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO. SCALE, %	0.5500E 02
MGO SLAK TANK	0.1680E 03			MAKEUP SETTING	0.5500E 02
MGOH2 TANK	0.1200E 03				
MAKEUP WATER	0.2050E 03				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER J-130

DATE 4-15-7C

TIME OF DAY 0001

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUMI. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	432.	115.0	---	---	---	---	0.009	59.4	424.	17.6
SECONDARY AIR	4883.	682.5	---	---	---	---	0.007	50.0	4851.	9.6
FURNACE EXIT	5656.	535.0	2824.3	---	---	3.0191	0.045	109.3	5450.	3.7
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	4930.	510.0	*****	*****	*****	*****	0.045	108.3	4716.	4.1
VENT ABS.INLET	4930.	510.0	*****	*****	*****	*****	0.045	108.3	---	-0.9
ABS CYC.EXIT	5829.	138.0	*****	*****	*****	*****	0.133	140.6	---	-21.7
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT GRIF.	5829.	133.0	57.0	*****	*****	*****	0.133	140.6	5143.	-21.7

SCRUBBER STREAM DATA

	TEMP.,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	*****	*****	MAKEUP WATER	TEMP.,F FLOW,#/M	TEMP.,F FLOW,#/M
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	205.0	9.2
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	120.0	5.9
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	135.0	18.1
			REC.(FLOW NOZ.)	135.0	577.4
					465.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.506E 07
% FUEL AS COAL	96.3
COAL FLOW RATE,#/HR	400.2
NAT.GAS FLOW,#/HR	8.5
% EXCESS AIR	24.3
OXYGEN,% DRY, MEAS.	5.10
CO2,% DRY-CALC.	13.65
HUMIDITY,#/# - CALC.	0.045

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	97.68
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	73.6
LIQ/GAS,GAL/MCF	33.4
LIQ/GAS,#/#	4.8
PRES.DROP,IN.WG	9.0

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2,	=	243.0
SULFITE/SC2-MOL/MOL	=	5.31
SUMP RESID.TIME,MIN	=	7.3

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2	=	*****
SULFITE/SC2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0360
MOL% TOTAL SULF=	9.51
O2 AT FURN.EX.=	5.10
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-130

DATE 4-15-70

TIME OF DAY 0001

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 14.81
 OUTPUT, #/HR 16.16
 PART. SCRUBBER
 INPUT, #/HR
 OUTPUT, #/HR
 INPUT FLOW, # - KIN. PROG.
 INPUT FLOWS, # ATOMS/100% FEED
 CARBON 0.428470
 HYDROGEN 0.503389
 OXYGEN 1.398835
 NITROGEN 5.091524
 SULFUR 0.008136

SO2 ABSORBERS
 INPUT, #/HR 16.16
 OUTPUT, #/HR 13.94

*SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 2.28
 COMBINED 2.28
 FREE 0.0
 MONO(TOTAL) 2.28
 MONO(DISSOLVED) 0.58
 MONO(SOLID) 1.70
 BISULFITE 0.32
 MGO 0.46
 SULFATE 0.23
 MAGNESIUM 2.97
 FLYASH
 SOLIDS, MG

FEED RATE, #/SEC = 1.58
 ENTHALPY, BTU/# = 1383.

MAKEUP NGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.50
 NGO PRESLAKED, NC=0, YES=1 0
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = *****
 SP. GRAVITY, HYDROM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-131	CARD NUMBER	2	CARD NUMBER	3
DATE	4-15-70	WINDBOX ST,H2O	0.6000E 01	N.G. FLOW,%SCALE	0.9700E 02
TIME	1300	BURNER DP,H2O	0.5500E 01	N.G. STATIC,R.O.	0.8800E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.3700E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1600E 01	O2 FURN.EX.%-BM	0.6000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	CUMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2901E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR ORIF.	0.1200E 03	PART.SCRUB.IN	0.0
ABS NOZ.,PSIG	0.2500E 02	WINDBOX-TOP	0.6400E 03	#1 URIFICE	0.4500E 03
ABS LOAD,PSIG	0.2800E 02	WINDBOX-WEST	0.6650E 03	FBA INLET	0.0
ABS CRIF.INCH	0.6200E 01	WINDBOX-BOT.	0.6650E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6800E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6900E 03	PRI.AIR FAN IN.	0.8900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5800E 03	PRI.AIR WGT BULB	0.6600E 02
MODE CF OPER.	4	FURN. EXIT	0.4700E 03	SEC.AIR FAN IN.	0.6400E 02
PART.SCR.ST,HG	0.0	COAL-AIR	0.1100E 03	SEC.AIR WFT BULB	0.6000E 02
PART.SCR.DP,H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.0	VENT.ABS.DP,H2O	0.8400E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	0.2000E 00	ABS CYC.DP,H2O	0.5500E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.5000E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1040E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.0	ABS CYC.EXIT	0.1330E 03	PART.FINAL,GAL	0.0
FBA EXIT	0.0	PART.CYC.SUMP	0.0	PART.TINI,MIN	0.0
P.P.EXIT	0.1290E 03	ABS CYC.SUMP	0.1300E 03	ABS H2O IN,GAL	0.2567E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.0	ABS H2O 11,GAL	0.2593E 05
ABS CYC.SUMP	0.1270E 03	WGD SLAK TANK	0.1500E 03	ABS H2O 11,MIN	0.6000E 02
FBA SUMP	0.0	MGCH2 TANK	0.1400E 03	PGB NOTO.SCALE	0.3400E 02
WGD SLAK TANK	0.1760E 03			MAKEUP SETTING	0.3400E 02
MGCH2 TANK	0.1250E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER J-131

DATE 4-15-70

TIME OF DAY 1300

FLUE GAS DATA

PRIMARY AIR
SECONDARY AIR
FURNACE EXIT
PART.SCRB.INLET
PART.CYC.EXIT
VENT ABS.INLET
ABS CYC.EXIT
FLOATING BED IN
FLOATING BED EX
P.P. EXIT ORIF.

FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
491.	110.0	---	---	---	---	0.010	60.2	486.	16.3
4814.	662.5	---	---	---	---	0.011	65.2	4761.	6.0
5662.	470.0	3049.7	---	---	---	0.048	109.8	5405.	2.2
5080.	450.0	---	---	---	---	0.048	109.8	---	2.7
5080.	450.0	---	---	---	---	0.048	109.8	---	-2.3
5995.	133.0	---	---	---	---	0.120	137.4	---	-21.7
5995.	129.0	107.6	---	---	---	0.120	137.4	5352.	-21.7

SCRUBBER STREAM DATA

PARTICULATE
MAKEUP WATER
PRODUCT LIQ.
RECIRCULATED LIQ.

TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP, F	FBA TEMP, F	FLUO, #/M
9.2	60.0	9.2	60.0	9.2	9.2
4.3	125.0	4.3	125.0	4.3	4.3
9.5	130.0	9.5	130.0	9.5	9.5
577.4	130.0	577.4	130.0	577.4	577.4
517.9	130.0	517.9	130.0	517.9	517.9

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR
% FUEL AS CUAL
COAL FLOW RATE, #/HR
NAT. GAS FLOW, #/HR
% EXCESS AIR
OXYGEN, % DRY, MEAS.
CO2, % DRY-CALC.
HUMIDITY, #/# - CALC.

0.475E 07	SO2 ABSORB.EFF	FLYASH CUL.EFF	SO3 ABSORB.EFF	NCX ABSORB.EFF	GAS VELOCITY, FPS	LIQ/GAS, GAL/MCF	LIQ/GAS, #/#	PRES.DROP, IN.WG
95.9	---	---	---	---	---	---	---	---
374.3	---	---	---	---	---	---	---	---
8.8	---	---	---	---	---	---	---	---
28.6	---	---	---	---	---	---	---	---
6.00	---	---	---	---	---	---	---	---
12.86	---	---	---	---	---	---	---	---
0.048	---	---	---	---	---	---	---	---

SO2 ABSORPTION PARAMETERS
VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 217.3
SULFITE/SO2-MOL/MOL = 8.69
SUMP RESID.TIME, MIN = 13.9

***** MEANS ITEM NOT MEASURED

VENT ABS.
96.47
79.5
37.2
5.2
8.4

FLOAT.FED
6.043
0.51
6.00
6.00

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L = 0.043
MOL% TOTAL SULF = 0.51
O2 AT FURN. EX. = 6.00
O2 AT ABSORB. IN. = 6.00
O2 AT ABSORB. EX. = 6.00

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-131

DATE 4-15-70

TIME OF DAY 1300

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.405761
HYDROGEN	0.490803
OXYGEN	1.401440
NITROGEN	5.112443
SULFUR	0.007688

FEED RATE, #/SEC = 1.56

ENTHALPY, BTU/# = -902.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	2.77
COMBINED	2.77
FREE	0.0
MONO(TOTAL)	2.77
MONO(DISSOLVED)	0.96
MONO(SOLID)	1.81
BISULFITE	0.0
MGO	0.25
SULFATE	0.28
MAGNESIUM	3.30
FLYASH	----
SOLIDS, MG	----

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 10.30

MGO PRESLAKED, NU=0, YES=1

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.90

SP.GRAVITY, HYDROM. = 1.0700

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-132	CARD NUMBER	2	CARD NUMBER	3
DATE	4-15-70	WINDBOX ST, H2O	0.7000E 01	N.G. FLOW, %SCALE	0.9700E 02
TIME	1430	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8800E 01
PRI. AIR ST, HG	0.1400E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.3700E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.2400E 01	O2 FURN. EX. % - BM	0.6000E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5200E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. FILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2900E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1200E 03	PART. SCRUB. IN	0.0
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6400E 03	#1 CRIFICE	0.4500E 03
ABS LOAD, PSIG	0.2800E 02	WINDBOX-WEST	0.6650E 03	FBA INLET	0.0
ABS ORIF. INCH	0.6200E 01	WINDBOX-BOT.	0.6650E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6800E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6900E 03	PRI. AIR FAN IN.	0.8700E 02
		NO. 2 BANK OUT	0.5800E 03	PRI. AIR WGT BULB	0.6500E 02
CARD NUMBER	7	FURN. EXIT	0.4700E 03	SEC. AIR FAN IN.	0.6400E 02
MODE CF OPER.	4	COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.5900E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0				
PART. CYC. DP, H2O	0.0				
#1 ORIF. ST, HG	0.2000E 00				
#1 ORIF. DP, H2O	0.5000E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.8400E 01	FBA INLET ST, HG	0.0
ABS CYC. DP, H2O	0.5500E 01	FBA SUMP DP, H2O	0.0
		FBA DP, H2O	0.0
		FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1040E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. EXIT	0.1330E 03	PART. FINAL, GAL	0.0
FBA EXIT	0.0	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1290E 03	ABS CYC. SUMP	0.1300E 03	ABS H2O IN. GAL	0.2587E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.0	ABS H2O FI. GAL	0.2593E 05
ABS CYC. SUMP	0.1270E 03	MGO SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.1300E 03	MGO ROTO. SCALE, %	0.3400E 02
MGO SLAK TANK	0.1780E 03			MAKEUP SETTING	0.3400E 02
MGOH2 TANK	0.1250E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER J-132

DATE 4-15-70

TIME OF DAY 1430

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	492.	110.0	---	---	---	---	0.009	59.3	468.	19.0
SECONDARY AIR	4806.	662.5	---	---	---	---	0.011	63.4	4756.	7.0
FURNACE EXIT	5656.	470.0	3147.5	---	---	---	0.047	109.4	5402.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
PART.CYC.EXIT	5080.	450.0	*****	*****	*****	*****	0.047	107.4	4852.	2.7
VENT ABS.INLET	5080.	450.0	*****	*****	*****	*****	0.047	109.4	---	2.3
ABS CYC.EXIT	6026.	133.0	*****	*****	*****	*****	0.118	135.6	---	-32.5
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT URIF.	6026.	1129.0	75.0	*****	*****	0.0240	0.118	135.6	5391.	-32.5

SCRUBBER STREAM DATA

	TEMP,F	FLCW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW, GPM	FRA TEMP,F FLOW, GPM
PARTICULATE	*****	*****	60.0	9.2	*****
MAKEUP WATER	*****	*****	125.0	4.3	*****
PRODUCT LIQ.	*****	*****	130.0	10.7	*****
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	577.4	*****
			REC.(FLOW NOZ.)	517.9	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.475E 07
% FUEL AS COAL	95.9
COAL FLOW RATE,#/HR	374.1
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	28.6
OXYGEN,% DRY, MEAS.	6.00
CO2,% DRY-CALC.	12.86
HUMIDITY, #/# - CALC.	0.047

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = 244.6
 SULFITE/SO2-MOL/MOL = 8.71
 SUMP RESID.TIME, MIN = 12.3

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	*****
FLYASH CUL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	82.2
LIQ/GAS,GAL/MCF	36.0
LIQ/GAS, #/#	5.2
PRES.DROP, IN.WG	8.4

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2
 SULFITE/SO2-MOL/MOL
 SUMP RESID.TIME, MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0314
 MOL% TOTAL SULF= 9.86
 O2 AT FURN.EX.= 6.00
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-132

DATE 4-15-70

TIME OF DAY 1430

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR

13.84
17.91

MAGNESIUM

FLYASH

27.68

WATER

234.7
253.6

DRY GAS

5396.
5402.

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

17.91
7.08

16.43
5.29

0.22

1012.
1254.

4852.
5391.

*SC2 ABSORBERS- PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

1.87
1.87
0.0
1.87
1.00
0.87
0.0
0.12
0.20
2.19

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 10.50
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

FEED RATE, #/SEC= 1.66
ENTHALPY, BTU/# = -605.

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.70
SP.GRAVITY, HYDRON. = 1.0580

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

INPUT FLOWS, #ATOMS/100 FEED
CARBON 0.405759
HYDROGEN 0.437065
OXYGEN 1.401438
NITROGEN 5.112447
SULFUR 0.007667

INPUT FOR EQ. - KIN. PROG.

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-133	DATE	4-15-70	TIME	2130	CARD NUMBER	2	CARD NUMBER	3
PRI. AIR ST, HG	0.1250E 01					WINDBOX ST, H2O	0.7400E 01	N.G. FLOW, %SCALE	0.9600E 02
PRI. AIR DP, H2O	0.2300E 01					BURNER DP, H2O	0.5900E 01	N.G. STATIC, R.O.	0.8200E 01
SEC. AIR ST, HG	0.1400E 01					FURN. ST, H2O	0.2400E 01	SCRUB SPED, RPM	0.4000E 03
SEC. AIR DP, H2O	0.2400E 01					PP EXIT ST, HG	-0.1000E 01	O2 FURN. EX. %BM	0.4000E 01
						PP EXIT DP, H2O	0.4800E 01	COMP. FURN. EX. %	0.0
						FURN. EX. ST, H2O	0.2400E 01	ELE. CHEM. MILVOLT	0.0
						PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
						P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2904E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LCAD, PSIG	0.0	SEC. AIR ORIF.	0.1000E 03	PART. SCRUB. IN	0.0
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6900E 03	#1 ORIFICE	0.4300E 03
ABS LOAD, PSIG	0.3100E 02	WINDBOX-VEST	0.6600E 03	FBA INLET	0.0
ABS CRIF. INCH	0.6600E 01	WINDBOX-BUT.	0.6600E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6800E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.7100E 03	PRI. AIR FAN IN.	0.7600E 02
		NO. 2 BANK OUT	0.6980E 03	PRI. AIR WGT BULB	0.5900E 02
CARD NUMBER	7	FURN. EXIT	0.4800E 03	SEC. AIR FAN IN.	0.4500E 02
MODE OF OPER.	4	COAL-AIR	0.1000E 03	SEC. AIR WGT BULB	0.4350E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.2200E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	0.5000E-01	ABS CYC. DP, H2O	0.5900E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.5300E 01			FBA DP, H2O	0.0
				FBA DENIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1220E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. EXIT	0.1510E 03	PART. FINAL. GAL	0.0
FBA EXIT	0.0	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1420E 03	ABS CYC. SUMP	0.1320E 03	ABS H2O IN. GAL	0.2703E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.0	ABS H2O FI. GAL	0.2709E 05
ABS CYC. SUMP	0.1300E 03	MGU SLAK TANK	0.1100E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0	MGU2 TANK	0.1300E 03	MGU ROTO. SCALE, %	0.3300E 02
MGU SLAK TANK	0.9300E 02			MAKEUP SETTING	0.3300E 02
MGU2 TANK	0.1260E 03				
MAKEUP WATER	0.0				

MAGNESIUM BASE SLURRY SCUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER J-133

DATE 4-15-70

TIME OF DAY 2130

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW PCINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	496.	100.0	-----	-----	-----	-----	0.008	54.2	492.	16.9
SECONDARY AIR	5014.	672.5	-----	-----	-----	-----	0.006	49.2	4983.	7.4
FURNACE EXIT	5933.	480.0	3226.0	-----	-----	3.5844	0.047	109.9	5665.	2.4
PART. SCRUB. INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
PART. CYC. EXIT	5296.	430.0	*****	*****	*****	*****	0.047	109.7	5057.	0.7
VENT. ABS. INLET	5296.	430.0	*****	*****	*****	*****	0.047	109.7	-----	-4.6
ABS. CYC. EXIT	5927.	151.0	*****	*****	*****	*****	0.099	132.2	-----	-13.5
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5927.	142.0	117.7	*****	*****	*****	0.099	132.2	5394.	-13.5

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	*****	*****	MAKEUP WATER	TEMP, F	TEMP, F
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	FLOW, #/M	FLOW, #/M
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	9.4	*****
RECIRCULATED LIQ.	*****	*****	REC. (SPRAY NOZ)	4.3	*****
			REC. (FLOW NOZ.)	14.3	*****
				577.4	*****
				534.4	*****

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.560E 07
% FUEL AS COAL	96.6
COAL FLOW RATE, #/HR	444.4
NAT. GAS FLOW, #/HR	8.7
% EXCESS AIR	19.0
OXYGEN, % DRY, MEAS.	4.00
CO2, % DRY-CALC.	14.61
HUMIDITY, #/# - CALC.	0.047

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	215.4
SULFITE/SC2-MOL/MOL	=	9.17
SUMP RESID. TIME, MIN	=	11.5

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	*****
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	77.8
LIQ/GAS, GAL/MCF	39.2
LIQ/GAS, #/#	5.4
PRES. DROP, IN. WG	2.2

VENT ABS.

96.35

FLOAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	0.0323
SULFITE/SC2-MOL/MOL	=	4.52
SUMP RESID. TIME, MIN	=	4.00
U2 AT ABSORB. IN	=	*****
U2 AT ABSORB. EX	=	*****

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	*****
SULFITE/SC2-MOL/MOL	=	*****
SUMP RESID. TIME, MIN	=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-133

DATE 4-15-70

TIME OF DAY 2130

MATERIAL BALANCES

INPUT FUR EC. - KIN. PROC.

INPUT FLOWS, #ATOMS/100#FLED

CARBON	0.455711
HYDROGEN	0.513803
OXYGEN	1.395675
NITROGEN	5.066437
SULFUR	0.008668

FEED RATE, #/SEC= 1.65

ENTHALPY, BTU/# = 484.

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	16.44	-----	32.88	243.9	5656.
OUTPUT, #/HR	19.11	-----	34.03	267.6	5655.

PART. SCRUBBER	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	*****	-----	*****	*****	*****
OUTPUT, #/HR	*****	-----	*****	*****	*****

SU2 ABSORBERS	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	19.11	15.84	34.03	1035.	5057.
OUTPUT, #/HR	21.64	15.76	*****	1321.	5394.

* *SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGC COMPOSITION
COMBINED	4.68	0.7316	-----	SLURRY CONC. - GM MGD/100ML = 10.30
FREE	4.68	0.7316	-----	MGD PRESLAKED, NO=0, YES=1
MONO(TOTAL)	0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	4.68	0.7316	-----	
MONO(SOLID)	1.04	0.1625	-----	
BISULFITE	3.64	0.5691	1.690	PRODUCT MG BASE PHYSICAL PROPERTIES
BGO	0.0	0.0	12.064	ACID STRENGTH, PH = 7.80
SULFATE	0.0	0.0	0.0	SP.GRAVITY, HYDROM. = 1.0400
MAGNESIUM	0.21	0.0323	0.388	
FLYASH	4.89	0.7639	-----	
SOLIDS, MG	-----	-----	*****	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-134	CARD NUMBER	2	CARD NUMBER	3
DATE	4-16-70	WINDBOX ST, H2O	0.9200E 01	N.G. FLOW, ZSCALE	0.9500E 02
TIME	0300	BURNER DP, H2O	0.5700E 01	N.G. STATIC, R.O.	0.8800E 01
PRI. AIR ST, HG	0.1500E 01	FURN. ST, H2O	0.3700E 01	SCREEN SPEED, RPM	0.4000E 03
PRI. AIR UP, H2O	0.1700E 01	PP EXIT ST, HG	-0.9000E 00	O2 FURN. EX. Z-BM	0.4000E 01
SEC. AIR ST, HG	0.1650E 01	PP EXIT DP, H2O	0.4500E 01	CCVD. FURN. EX. Z	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.3700E 01	ELE. CHEM. FILVULT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2901E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F	0.1000E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR GRIF.	0.7000E 03	PART. SCRUB. IN	0.0
ABS NOZ., PSIG	0.2550E 02	WINDBOX-TOP	0.6700E 03	#1 ORIFICE	0.4300F 03
ABS LOAD, PSIG	0.3150E 02	WINDBOX-WEST	0.6700E 03	FBA INLET	0.0
ABS URIF. INCH	0.6600E 01	WINDBOX-BOT.	0.6700E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6900E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO. 1 BANK CUT	0.7250E 03	PRI. AIR FAN IN.	0.6600E 02
		NO. 2 BANK OUT	0.6300E 03	PRI. AIR HOT BULB	0.5400E 02
CARD NUMBER	7	FURN. EXIT	0.4800E 03	SEC. AIR FAN IN.	0.3600E 02
NOUE LF OPER.	4	CCAL-AIR	0.1000E 03	SEC. AIR NET BULB	0.3500E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.2000E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	0.2000E 00	ABS CYC. DP, H2O	0.5500E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.5100E 01			FBA CP, H2O	0.0
				FBA GPMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.9900E 02	TEMP. THERMOMETERS, F	0.0	MAKEUP FLOWS	
#1 CRIFICE	0.0	PART. CYC. EXIT	0.1520E 03	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.0	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.0
P. P. EXIT	0.1440E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.2762E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1700E 03	ABS H2O FI. GAL	0.2771E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1100E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK		MGO ROTO. SCALE, %	0.3200E 02
MGO SLAK TANK	0.1680E 03			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.1060E 03				
MAKEUP WATER	0.0				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER J-134

DATE 4-16-70

TIME OF DAY 0300

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NUX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	428.	100.0	---	---	---	---	0.006	49.4	425.	20.3
SECONDARY AIR	4821.	652.5	---	---	---	---	0.005	40.9	4798.	9.3
FURNACE EXIT	5652.	480.0	3105.6	---	---	---	0.046	108.9	5405.	3.7
PART. SCRUB. INLET	---	---	---	---	---	---	---	---	---	---
PART. CYC. EXIT	5208.	430.0	---	---	---	---	---	---	---	---
VENT AMS. INLET	5208.	430.0	---	---	---	---	0.046	108.8	---	2.7
ABS CYC. EXIT	5741.	152.0	---	---	---	---	0.046	108.8	---	-2.4
FLOATING BED IN.	---	---	---	---	---	---	---	---	---	-12.2
FLOATING BED EX	---	---	---	---	---	---	---	---	---	---
P.P. EXIT ORIF.	5741.	144.0	476.0	---	---	---	0.096	131.3	5239.	-12.2

SCRUBBER STREAM DATA

PARTICULATE	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FRA
MAKEUP WATER	---	---	MAKEUP WATER	TEMP, F FLOW, #/M	TEMP, F FLOW, #/M
PRODUCT LIQ.	---	---	MAKEUP NGU SL.	0.0 13.2	---
RECIRCULATED LIQ.	---	---	PRODUCT LIQ.	106.0 4.2	---
	---	---	REC. (SPRAY NOZ)	132.0 14.3	---
	---	---	REC. (FLOW NOZ.)	132.0 584.2	---
	---	---		534.4	---

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.535E 07
% FUEL AS COAL	96.4
COAL FLOW RATE, #/HR	423.5
NAT. GAS FLOW, #/HR	8.6
% EXCESS AIR	19.0
UXYGEN, % DRY, MEAS.	4.00
CO2, % DRY - CALC.	14.61
HUMIDITY, #/# - CALC.	0.046

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	---
FLYASH COL. EFF	---
SO3 ABSORB. EFF	---
NUX ABSORB. EFF	---
GAS VELOCITY, FPS	75.2
LIQ/GAS, GAL/MCF	40.6
LIQ/GAS, #/#	5.6
PRES. DROP, IN. WG	2.0

VENT AIR

84.67

FLOAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	118.5
SULFITE/SO2-MOL/MOL	=	8.11
SUMP RESID. TIME, MIN	=	22.9

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	---
SULFITE/SC2-MOL/MOL	=	---
SUMP RESID. TIME, MIN	=	---

SULFATE FORMATION PARAMETERS

CONC., GR-MUL/L=	0.0300
MOL% TOTAL SULF=	8.52
O2 AT FURN. EX.=	4.00
O2 AT ABSORB. IN=	---
O2 AT ABSORB. EX=	---

**** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-134

DATE 4-16-70

TIME OF DAY 0300

MATERIAL BALANCES

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR
15.67
17.55

MAGNESIUM
31.34

FLYASH
228.4
247.0

WATER
5397.
5405.

DRY GAS

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SULFUR
17.55
14.62

MAGNESIUM
9.29

FLYASH
1272.
1318.

WATER
4980.
5239.

ENTHALPY, BTU/# = 1685.

SU2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

SULFUR
17.55
14.62

MAGNESIUM
9.29

FLYASH
1272.
1318.

WATER
4980.
5239.

ENTHALPY, BTU/# = 1685.

* #SU2 ABSORBERS-
PRODUCT COMP.

SULFUR
17.55
14.62

MAGNESIUM
9.29

FLYASH
1272.
1318.

WATER
4980.
5239.

ENTHALPY, BTU/# = 1685.

TOTAL,
COMBINED
FREE
MUNO(TOTAL)
MUNO(DISSOLVED)
MUNO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

SULFUR
17.55
14.62

MAGNESIUM
9.29

FLYASH
1272.
1318.

WATER
4980.
5239.

ENTHALPY, BTU/# = 1685.

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

INPUT FOR EQ. - KIN. PROC.

INPUT FLOWS, #AIGS/100%FEED
CARBON 0.455504
HYDROGEN 0.501805
OXYGEN 1.395658
NITROGEN 5.066638
SULFUR 0.008657

FEED RATE, #/SEC = 1.57

ENTHALPY, BTU/# = 1685.

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGD/100ML =
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. =

PRODUCT MGO BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.70
SP.GRAVITY, HYDROM. = 1.0450

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH =
FLYASH CONC. GM/100ML =

* #SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-135					
DATE	4-16-70					
TIME						
PRI.AIR ST, HG	0.1400E 01					
PRI.AIR DP,H20	0.2200E 01					
SEC.AIR ST,HG	0.1400E 01					
SEC.AIR DP,H20	0.2300E 01					
WINDBOX ST,H20	0.5500E 01					
BURNER DP,H20	0.5000E 01					
FURN. ST,H20	0.2000E 01					
PP EXIT ST,HG	-0.1400E 01					
PP EXIT DP,H20	0.5000E 01					
FURN.EX.ST,H20	0.2200E 01					
PEEPSITE DP,HG	0.0					
P.SITE ST,PSIG	0.0					
TEMP.FURN.RECORDER,F	0.1250E 03					
SEC.AIR ORIF.	0.6900E 03					
WINDBOX-TOP	0.6700E 03					
WINDBOX-WEST	0.6700E 03					
WINDBOX-BOT.	0.6850E 03					
WINDBOX-EAST	0.7600E 03					
NO.1 BANK OUT	0.6600E 03					
NO.2 BANK OUT	0.4900E 03					
FURN. EXIT	0.1700E 03					
COAL-AIR						
TEMP. CONTINUED						
PART.SCRUB.IN	0.0					
#1 ORIFICE	0.5000E 03					
FBA INLET	0.0					
AIR HEATER #1	0.7500E 03					
AIR HEATER #2	0.7500E 03					
PRI.AIR FAN IN.	0.6800E 02					
PRI.AIR NOT BULB	0.6500E 02					
SEC.AIR FAN IN.	0.7200E 02					
SEC.AIR NOT BULB	0.6800E 02					
FBA INLET ST,HG	0.0					
FBA SUMP DP,H20	0.0					
FBA DP,H20	0.0					
FBA DEMIST.DP,H20	0.0					
TEMP.THERMOMETERS,F						
PART.CYC.EXIT	0.0					
ABS CYC.EXIT	0.1500E 03					
PART.CYC.SUMP	0.0					
ABS CYC.SUMP	0.1320E 03					
FBA SUMP	0.0					
MGO SLAK TANK	0.0					
MGOH2 TANK	0.1300E 03					
TEMP.PILOT RECORDER,F	0.1080E 03					
#1 ORIFICE	0.0					
FBA INLET	0.0					
FBA EXIT	0.0					
P.P.EXIT	0.1420E 03					
PART.CYC.SUMP	0.0					
ABS CYC.SUMP	0.1280E 03					
FBA SUMP	0.0					
MGO SLAK TANK	0.0					
MGOH2 TANK	0.1300E 03					
MAKEUP WATER	0.6000E 02					
TEMP.FURN.RECORDER,F	0.1250E 03					
SEC.AIR ORIF.	0.6900E 03					
WINDBOX-TOP	0.6700E 03					
WINDBOX-WEST	0.6700E 03					
WINDBOX-BOT.	0.6850E 03					
WINDBOX-EAST	0.7600E 03					
NO.1 BANK OUT	0.6600E 03					
NO.2 BANK OUT	0.4900E 03					
FURN. EXIT	0.1700E 03					
COAL-AIR						
TEMP. CONTINUED						
PART.SCRUB.IN	0.0					
#1 ORIFICE	0.5000E 03					
FBA INLET	0.0					
AIR HEATER #1	0.7500E 03					
AIR HEATER #2	0.7500E 03					
PRI.AIR FAN IN.	0.6800E 02					
PRI.AIR NOT BULB	0.6500E 02					
SEC.AIR FAN IN.	0.7200E 02					
SEC.AIR NOT BULB	0.6800E 02					
FBA INLET ST,HG	0.0					
FBA SUMP DP,H20	0.0					
FBA DP,H20	0.0					
FBA DEMIST.DP,H20	0.0					
TEMP.THERMOMETERS,F						
PART.CYC.EXIT	0.0					
ABS CYC.EXIT	0.1500E 03					
PART.CYC.SUMP	0.0					
ABS CYC.SUMP	0.1320E 03					
FBA SUMP	0.0					
MGO SLAK TANK	0.0					
MGOH2 TANK	0.1300E 03					
MAKEUP WATER	0.6000E 02					
TEMP.PILOT RECORDER,F	0.1080E 03					
#1 ORIFICE	0.0					
FBA INLET	0.0					
FBA EXIT	0.0					
P.P.EXIT	0.1420E 03					
PART.CYC.SUMP	0.0					
ABS CYC.SUMP	0.1280E 03					
FBA SUMP	0.0					
MGO SLAK TANK	0.0					
MGOH2 TANK	0.1300E 03					
MAKEUP WATER	0.6000E 02					

RUN NUMBER J-135

DATE 4-16-70

TIME OF DAY

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/OSCF	HUM. #/%	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	478.	120.0	---	---	---	---	0.009	58.6	473.	19.0
SECONDARY AIR	4793.	678.8	---	---	---	---	0.014	70.8	4728.	5.5
FURNACE EXIT	5667.	490.0	3321.3	---	---	---	0.053	113.8	5379.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	5243.	500.0	*****	*****	*****	*****	0.053	113.9	4977.	2.7
VENT ABS.INLET	5243.	500.0	*****	*****	*****	*****	0.053	113.9	---	-2.9
ABS CYC.EXIT	5958.	150.0	*****	*****	*****	*****	0.128	139.9	---	-19.0
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
P.P. EXIT GRIF.	5958.	142.0	429.9	*****	*****	*****	0.128	139.9	5282.	-19.0

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP, F FLOW, #/M	FBA TEMP, F FLOW, #/M
PARTICULATE	*****	*****	60.0	22.3	*****
MAKEUP WATER	*****	*****	130.0	4.2	*****
PRODUCT LIQ.	*****	*****	132.0	20.2	*****
RECIRCULATED LIQ.	*****	*****	132.0	577.4	*****
			REC. (SPRAY NOZ.)	500.9	*****
			REC. (FLOW NOZ.)		*****

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.526E 07
% FUEL AS COAL	96.3
COAL FLOW RATE, #/HR	416.1
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	20.0
OXYGEN, % DRY, MEAS.	4.20
CO2, % DRY-CALC.	14.43
HUMIDITY, #/# - CALC.	0.053

SU2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	130.3
SULFITE/SO2-MOL/MOL	=	9.18
SUMP RESID.TIME, MIN	=	8.1

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY, FPS	80.5
LIQ/GAS, GAL/MCF	35.5
LIQ/GAS, #/H	5.0
PRES.DROP, IN.WG	2.8

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME, MIN	=	*****

PART.

VENT ABS.

87.05

FLOAT. BED

SULFATE FORMATION PARAMETERS

CUNC., GM-MOLE/L	=	0.0263
MOL % TOTAL SULF	=	5.50
O2 AT FURN. EX.	=	4.20
O2 AT ABSORB. IN	=	*****
O2 AT ABSORB. EX	=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-135

DATE 4-16-70

TIME OF DAY

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	15.40	---	---	30.79	268.4	5372.	
OUTPUT, #/HR	18.70	---	---	*****	287.5	5379.	
PART. SCRUBBER		*****	---	*****	*****	*****	
INPUT, #/HR	*****	---	---	*****	*****	*****	
OUTPUT, #/HR	*****	---	---	*****	*****	*****	

SO2 ABSORBERS

INPUT, #/HR 18.70

OUTPUT, #/HR 21.62

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL, 3.00

COMBINED 3.00

FREE 0.0

MONO(TOTAL) 3.00

MONO(DISSOLVED) 1.12

MONO(SOLID) 1.88

BISULFITE 0.0

MGO 0.29

SULFATE 0.17

MAGNESIUM 3.46

FLYASH ---

SOLIDS, MG ---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #/TONS/100#FEED

CARBON 0.450397

HYDROGEN 0.524263

OXYGEN 1.396214

NITROGEN 5.071352

SULFUR 0.008552

FEED RATE, #/SEC= 1.56

ENTHALPY, BTU/# = -2602.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 10.10

MGO PRESLAKED, NO=0, YES=1

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.60

SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-136	CARD NUMBER	2	CARD NUMBER	3
DATE	4-16-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLUX, %SCALE	0.9800E 02
TIME	1500	BURNER DP, H2O	0.5500E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1400E 01	FURN. ST, H2O	0.2000E 01	SCREEN SPEED, RPM	0.3700E 03
PRI. AIR DP, H2O	0.2500E 01	PP EXIT ST, HG	-0.1800E 01	O2 FURN. EX. % - BM	0.4400E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5000E 01	COMP. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2910E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F	0.1250E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.6900E 03	PART. SCRUB. IN	0.4900E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.6700E 03	#1 ORIFICE	0.5150E 03
ABS LOAD, PSIG	0.3000E 02	WINDBOX-WEST	0.6700E 03	FBA INLET	0.0
ABS ORIF. INCH	0.6200E 01	WINDBOX-BOT.	0.6700E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6800E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.7600E 03	PRI. AIR FAN IN.	0.8800E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.6800E 03	PRI. AIR WGT BULB	0.6700E 02
MODE OF OPER.	4	FURN. EXIT	0.5000E 03	SEC. AIR FAN IN.	0.6400E 02
PART. SCR. ST, HG	0.0	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.5500E 02
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.3400E 01	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	0.2000E 00	ABS CYC. DP, H2O	0.6000E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.6000E 01	CARD NUMBER	11	FBA DP, H2O	0.0
CARD NUMBER	10	TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.0
TEMP. PILOT RECORDER, F	0.1040E 03	PART. CYC. EXIT	0.0	CARD NUMBER	12
#1 ORIFICE	0.0	ABS CYC. EXIT	0.1480E 03	MAKEUP FLOWS	
FBA INLET	0.0	PART. CYC. SUMP	0.1500E 03	PART. INIT. GAL	0.0
FBA EXIT	0.0	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.0
P. P. EXIT	0.1400E 03	FBA SUMP	0.0	PAKT. TIME, MIN	0.0
PART. CYC. SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O IN. GAL	0.2974E 05
ABS CYC. SUMP	0.1300E 03	MGOH2 TANK	0.1200E 03	ABS H2O FI. GAL	0.2976E 05
FBA SUMP	0.0	CARD NUMBER	12	ABS H2O TIME, MIN	0.1500E 02
MGO SLAK TANK	0.1800E 03	TEMP. THERMOMETERS, F		MGO ROTO. SCALE, %	0.2500E 02
MGOH2 TANK	0.1200E 03	PART. CYC. EXIT	0.0	MAKEUP SETTING	0.2500E 02
MAKEUP WATER	0.6000E 02	ABS CYC. EXIT	0.1480E 03		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-136

DATE 4-16-70

TIME OF DAY 1500

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100-FFED

CARBON 0.445641

HYDROGEN 0.533090

OXYGEN 1.396801

NITROGEN 5.075722

SULFUR 0.008465

FURNACE

INPUT, #/HR 15.70

OUTPUT, #/HR 18.38

PART. SCRUBBER

INPUT, #/HR *****

OUTPUT, #/HR *****

SULFUR

MAGNESIUM

FLYASH

WATER

DRY GAS

FEED RATE, #/SEC= 1.61

ENTHALPY, BTU/# = -163.

5148.

5135.

*SO2 ABSORBERS-

PRODUCT COMP.

GM SO2/ 100ML

GM-MOLE/ LITER

GRAM/ 100ML

MAKEUP NGO COMPOSITION

SLURRY CONC.- GM NGO/100ML = 9.80

NGO PRESLAKED, NO=0, YES=1

% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,

COMBINED

FREE

MONO(TOTAL)

MONO(DISSOLVED)

MONO(SOLID)

BISULFITE

MGO

SULFATE

MAGNESIUM

FLYASH

SOLIDS, MG

0.3291

0.3291

0.0

0.3291

0.1437

0.1854

0.0219

0.0383

0.0415

0.4090

2.11

2.11

0.0

2.11

0.92

1.19

0.28

0.25

0.27

2.62

1.495

3.930

0.407

0.153

0.498

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

OXY+NIT 0.0817

SULFUR 0.0370

ASH 0.0740

WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	J-137	CARD NUMBER	2	CARD NUMBER	3
DATE	4-16-70	WINDBOX ST,H2O	0.8200E 01	N.G. FLOW, %SCALE	0.9500E 02
TIME	2330	BURNER DP,H2O	0.5700E 01	N.G. STATIC,R.O.	0.8500E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2500E 01	SCRFL SPEED,RPM	0.4500E 03
PRI.AIR DP,H2O	0.1800E 01	PP EXIT ST,HG	-0.1100E 01	O2 FURN.EX,%-BM	0.2700E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,FX,%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX,ST,H2O	0.2500E 01	ELE.CHEM.MILVCLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2903E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECCORDER,F		TEMP.CONTINUED	
PART.LCAD,PSIG	0.0	SEC.AIR GRIF.	0.1200E 03	PART.SCRUB.IN	0.0
ABS NOZ.,PSIG	0.2550E 02	WINDBOX-TUP	0.6900E 03	#1 ORIFICE	0.5450E 03
ABS LOAD,PSIG	0.3300E 02	WINDBOX-WEST	0.6650E 03	FBA INLET	0.0
ABS ORIF.INCH	0.6600E 01	WINDBOX-BOT.	0.6650E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.6850E 03	AIR HEATER #2	0.7500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8350E 03	PRI.AIR FAN IN.	0.7600E 02
CARD NUMBER	7	NO.2 BANK OUT	0.7350E 03	PRI.AIR WGT BULB	0.6000E 02
MODE OF OPER.		FURN. EXIT	0.5400E 03	SEC.AIR FAN IN.	0.4900E 02
PART.SCR.ST,HG	0.0	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.4600E 02
PART.SCK.DP,H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.0	VENT.ABS.DP,H2O	0.2700E 01	FBA INLET ST,HG	0.0
#1 ORIF.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.5600E 01	FBA SUMP DP,H2O	0.0
#1 ORIF.DP,H2O	0.5800E 01			FBA DP,H2O	0.0
				FBA DEMIST.DP,H2O	0.0
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1130E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.0	ABS CYC.EXIT	0.1570E 03	PART.FINAL,GAL	0.0
FBA EXIT	0.0	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1500E 03	ABS CYC.SUMP	0.1380E 03	ABS H2O IN,GAL	0.3028E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.0	ABS H2O FI,GAL	0.3037E 05
ABS CYC.SUMP	0.1350E 03	MGO SLAK TANK	0.1960E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK	0.1080E 03	MGO ROTO.SCALE,%	0.3500E 02
MGO SLAK TANK	0.1920E 03			MAKEUP SETTING	0.3500E 02
MGOH2 TANK	0.1060E 03				
MAKEUP WATER	0.0				

RUN NUMBER J-137

DATE 4-16-70

TIME OF DAY 2330

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	435.	110.0	----	----	----	----	0.008	56.3	431.	17.6
SECONDARY AIR	4724.	676.3	----	----	----	----	0.007	50.7	4692.	8.2
FURNACE EXIT	5584.	540.0	4278.3	----	----	4.3868	0.050	112.2	5316.	2.5
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
PART.CYC.EXIT	5222.	545.0	*****	*****	*****	*****	0.050	112.1	4971.	1.4
VENT ABS.INLET	5222.	545.0	*****	*****	*****	*****	0.050	112.1	-----	-4.4
ABS CYC.EXIT	5958.	157.0	*****	*****	*****	*****	0.131	141.1	-----	-14.9
FLOATING BED IN	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED EX	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
P.P. EXIT ORIF.	5958.	150.0	821.7	*****	*****	0.1003	0.131	141.1	5270.	-14.9

SCRUBBER STREAM DATA

	TEMP,F	FLCW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	F8A TEMP,F FLOW,#/M
PARTICULATE	*****	*****	0.0	13.3	*****
MAKEUP WATER	*****	*****	106.0	4.4	*****
PRODUCT LIQ.	*****	*****	138.0	11.1	*****
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	534.2	*****
			REC.(FLOW NOZ.)	534.4	*****

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.563E 07
% FUEL AS COAL	96.6
COAL FLOW RATE,#/HR	447.2
NAT.GAS FLOW,#/HR	8.6
% EXCESS AIR	12.9
OXYGEN,% DRY, MEAS.	2.70
CO2,% DRY-CALC.	15.74
HUMIDITY,#/# - CALC.	0.050

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	80.79
FLYASH COL.FFF	97.71
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	80.3
LIQ/GAS,GAL/MCF	38.0
LIQ/GAS,#/#	5.4
PRES.DROP,IN.WG	2.7

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FI2,	=	104.4
SULFITE/SO2-MOL/MOL	=	5.88
SUMP RESID.TIME,MIN	=	29.6

FLOATING BED ABSORBER

KGA,#MOLE/HR-FI2	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLF/L=	0.0351
MOL% TOTAL SULF=	4.03
U2 AT FURN.FX=	2.70
O2 AT ABSORB.IN=	*****
U2 AT ABSORB.FX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLAGGING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER J-137

DATE 4-16-70

TIME OF DAY 2330

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE

5.70
4.93
0.77

MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)

4.17
0.86
3.31

BISULFITE

0.60

MGO

0.0

SULFATE

0.22

MAGNESIUM

5.16

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

16.55
23.68

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

23.68
24.19

*SO2 ABSORBERS- PRODUCT COMP. </

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	K-138	CARD NUMBER	2	CARD NUMBER	3
DATE	4-9-70	WINDBOX ST, H2O	0.4500E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1500	BURNER DP, H2O	0.5200E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCRUB SPEED, RPM	0.4950E 03
PRI. AIR DP, H2O	0.2500E 01	PP EXIT ST, HG	-0.2000E 01	O2 FURN. EX. % - RM	0.3500E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.4600E 01	COKE FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2000E 01	FURN. EX. ST, H2O	0.2100E 01	ELE. CHES. FILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2875E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1100E 03	TEMP. CONTINUED	0.4800E 03
PART. LOAD, PSIG	0.4100E 02	SEC. AIR ORIF.	0.6400E 03	PART. SCRUB. IN	0.1500E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6100E 03	#1 ORIFICE	0.0
ABS LOAD, PSIG	0.2300E 02	WINDBOX-WEST	0.6100E 03	FBA INLET	0.7000E 03
ABS ORIF. INCH	0.5000E 01	WINDBOX-BUT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	6	WINDBOX-EAST	0.7600E 03	AIR HEATER #2	0.8100E 02
MANOMETER CODE	0	NO. 1 BANK OUT	0.7000E 03	PRI. AIR FAN IN.	0.5900E 02
		NO. 2 BANK OUT	0.5750E 03	PRI. AIR FAN MULB	0.6200E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC. AIR FAN IN.	0.5300E 02
MODE OF OPER.	2	COAL-AIR		SEC. AIR FAN MULB	
PART. SCR. ST, HG	0.3000E 00				
PART. SCR. DP, H2O	0.4200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5400E 01	VENT. ABS. DP, H2O	0.8000E 00	FBA INLET ST, HG	0.0
#1 ORIF. ST, HG	-0.9000E 00	ABS CYC. DP, H2O	0.4600E 01	FBA SUMP DP, H2O	0.0
#1 ORIF. DP, H2O	0.4200E 01			FBA DP, H2O	0.0
				FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1440E 03	TEMP. THERMOMETERS, F	0.1520E 03	MAKEUP FLOWS	0.1051E 06
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1360E 03	PART. INIT. GAL	0.1059E 06
FBA INLET	0.0	ABS CYC. EXIT	0.1340E 03	PART. FINAL, GAL	0.1350E 03
FBA EXIT	0.1310E 03	PART. CYC. SUMP	0.1340E 03	PART. TIME, MIN	0.2090E 05
P. P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.2100E 05
PART. CYC. SUMP	0.1300E 03	FBA SUMP	0.0	ABS H2O FI. GAL	0.1350E 03
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.8100E 02	ABS H2O TIME, MIN	0.4400E 02
FBA SUMP	0.0	MGOH2 TANK		MGO AUTO. SCALE, %	0.4400E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.4400E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRFS IN-H2O
PRIMARY AIR	510.	110.0	---	---	---	---	0.007	50.4	506.	16.3
SECONDARY AIR	4499.	622.5	---	---	---	---	0.008	53.9	4464.	4.5
FURNACE EXIT	5403.	575.0	***	***	657.	***	0.050	111.2	5147.	2.1
PART.SCRB.INLET	5403.	480.0	***	***	***	***	0.050	111.2	---	4.1
PART.CYC.EXIT	5486.	152.0	***	***	***	***	0.097	131.4	5002.	-12.2
VENT ABS.INLET	5486.	152.0	***	***	***	***	0.097	131.4	---	-16.4
ABS CYC.EXIT	5734.	136.0	***	***	***	***	0.092	128.2	---	-27.1
FLOATING BED IN	***	***	***	***	***	***	***	***	---	***
FLOATING BED EX	***	***	***	***	***	***	***	***	---	***
P.P. EXIT GRIF.	5734.	131.0	***	***	1036.	***	0.092	128.2	5251.	-27.1

SCRUBBER STREAM DATA

ROBBER STREAM DATA		VENTURI ABSORBER		FBA		
	TEMP, F	FLCW, GPM	TEMP, F	FLCW, #/M	TEMP, F	FLCW, #/N
PARTICULATE	60.0	5.30	60.0	6.4	***	***
MAKEUP WATER	134.0	4.99	81.0	5.1	***	***
PRODUCT LIQ.	134.0	23.15	134.0	12.8	***	***
RECIRCULATED LIQ.			134.0	504.0	***	***
				465.1	***	***

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR
% FUEL AS CGAL
COAL FLOW RATE, #/HR
NAT. GAS FLOW, #/HR
% EXCESS AIR
OXYGEN, % DRY, MEAS.
CO₂, % DRY-CALC.
HUMIDITY, #/# - CALC.

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	68.4
SULFITE/SG2-MOL/MUL	=	***
SUMP RESID.TIME, MIN	=	10.3

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

FLCATING RED ABSORBER

KGA, #MOLE/HR-FT2	=	*****
SULFITE/SC2-MCL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L =	0.2030
MOL% TOTAL SULF =	22.41
02 AT FURN. EX. =	3.50
02 AT ABSORB. IN =	*****
02 AT ABSORB. EX =	*****

C.523E 07	SCRUBBER PERFORMANCE	PART.	VENT	ABS.	FLOAT.PED
96.3	SU2 ABSORB.EFF	***	66.12	***	***
413.9	FLYASH COL.EFF	***	***	***	***
8.9	SO3 ABSORB.EFF	***	***	***	***
16.7	NUX ABSORB.EFF	***	***	***	***
3.50	GAS VELOCITY,FPS	153.4	76.6	***	***
15.03	LIQ/GAS,GAL/MCF	15.2	34.7	***	***
0.050	LIQ/GAS,#/#	2.1	4.9	***	***
	PRES.DRUP,IN.WG	4.2	0.8	***	***

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER K-138

DATE 4-9-70

TIME OF DAY 1500

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR

15.31

MAGNESIUM

FLYASH

30.63

WATER

236.4
255.5

DRY GAS

5140.
5147.

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

25.26

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

25.26
31.24

16.30
14.41

1148.
1232.

5002.
5251.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML

4.50
3.70
0.80
2.90

0.0
1.30
5.00

GM-MOLE/
LITER

0.7031
0.5781
0.1250
0.4531

0.0
0.2030
0.7812

GRAM/
100ML

C.0
2.436

MAKEUP H2O COMPOSITION

SLURRY CONC.- GM H2O/100ML = 8.90
H2O PRESLAKED, NO=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.00
SP.GRAVITY, HYDRON. = 1.0700

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*TOTAL SLURRY BASIS, MASS/VOLUME SLURRY

INPUT FOR EQ. - KII, PROG.
INPUT FLOWS, #ATOMS/100#FELD
CARBON 0.467304
HYDROGEN 0.518022
OXYGEN 1.394193
NITROGEN 5.055797
SULFUR 0.008873

FEED RATE, #/SEC= 1.50

ENTHALPY, BTU/# = -1670.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	K-139	CARD NUMBER	2	CARD NUMBER	3
DATE	4-9-70	WINDBOX ST, H2O	0.7800E 01	N.G. FLOW, ESCALE	0.9800E 02
TIME	1730	BURNER DP, H2O	0.5500E 01	N.G. STATIC, R.O.	0.8000E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.3000E 01	SCREW SPEED, RPM	0.4950E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1800E 01	O2 FURN. EX. % - BM	0.3000E 01
SEC. AIR ST, HG	0.1000E 01	PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2100E 01	FURN. EX. ST, H2O	0.3200E 01	ELE. CHEM. FILVCLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2874E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1100E 03	TEMP. CONTINUED	0.5100E 03
PART. LOAD, PSIG	0.4100E 02	SEC. AIR CRIF.	0.6400E 03	PART. SCRUB. IN	0.1500E 03
ABS NOZ., PSIG	0.2000E 02	WINDBOX-TOP	0.6200E 03	#1 ORIFICE	0.0
ABS LOAD, PSIG	0.2400E 02	WINDBOX-WEST	0.6200E 03	FBA INLET	0.7000E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.6300E 03	AIR HEATER #1	0.7000E 03
ABSORBER NOZ. CODE	0	WINDBOX-EAST	0.8000E 03	AIR HEATER #2	0.7500E 02
		NO.1 BANK OUT	0.7500E 03	PRI. AIR FAN IN.	0.5700E 02
		NO.2 BANK OUT	0.6100E 03	PRI. AIR WGT BULB	0.6000E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC. AIR FAN IN.	0.5000E 02
MODE OF OPER.	2	COAL-AIR		SEC. AIR WGT BULB	
PART. SCR. ST, HG	0.2000E 00				
PART. SCR. DP, H2O	0.4100E 01				
PART. CYC. DP, H2O	0.5800E 01				
#1 ORIF. ST, HG	-0.6000E 00				
#1 ORIF. DP, H2O	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.1610E 01	FRA INLET ST, HG	0.0
ABS CYC. DP, H2O	0.4800E 01	FRA SUMP DP, H2O	0.0
		FBA DP, H2O	0.0
		FBA DEMIST. DP, H2O	0.0

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1560E 03	TEMP. THERMOMETERS, F	0.1550E 03	MAKEUP FLOWS	0.1050E 06
#1 ORIFICE	0.0	PART. CYC. EXIT	0.1390E 03	PART. INIT. GAL	0.1060E 06
FBA INLET	0.0	ABS CYC. EXIT	0.1360E 03	PART. FINAL, GAL	0.4800E 02
FBA EXIT	0.1340E 03	PART. CYC. SUMP	0.0	ABS H2O IN. GAL	0.2100E 05
P.P. EXIT	0.1300E 03	ABS CYC. SUMP	0.0	ABS H2O FI. GAL	0.2104E 05
PART. CYC. SUMP	0.1350E 03	FBA SUMP	0.0	ABS H2O TIME, MIN	0.4800E 02
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.8100E 02	MGO ROTO. SCALE, %	0.6200E 02
FBA SUMP	0.0	MGOH2 TANK		MAKEUP SETTING	0.6200E 02
MGO SLAK TANK	0.8200E 02				
MAKEUP WATER	0.6000E 02				

TIME OF DAY 1730

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/USCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	489.	110.0	---	---	---	---	0.007	50.6	485.	15.3
SECONDARY AIR	455.	627.5	---	---	---	---	0.006	49.1	456.	7.8
FURNACE EXIT	5496.	610.0	***	***	740.	***	0.050	111.3	5236.	3.2
PART. SCRB. INLET	5496.	510.0	***	***	***	***	0.050	111.3	---	2.7
PART. CYC. EXIT	5517.	155.0	4921.2	***	***	***	0.089	129.3	5064.	-8.1
VENT ABS. INLET	5517.	155.0	***	***	***	***	0.089	129.3	---	-12.3
ABS CYC. EXIT	6006.	139.0	***	***	***	***	0.082	124.8	---	-24.4
FLOATING BED IN	***	***	***	***	***	***	***	***	---	***
FLOATING BED EX	***	***	***	***	***	***	***	***	---	***
P.P. EXIT ORIF.	6006.	134.0	1022.0	***	999.	***	0.082	124.8	5551.	-24.4

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FBA		
	TEMP, F	FLCW, GPM	TEMP, F	FLOW, #/H	TEMP, F	FLOW, #/H
PARTICULATE	60.0	2.87	60.0	7.1	***	***
MAKEUP WATER	136.0	5.09	82.0	6.4	***	***
PRODUCT LIQ.	136.0	23.15	137.0	15.7	***	***
RECIRCULATED LIQ.			137.0	504.0	***	***
			REC. (FLOW NOZ.)	455.7	***	***
			REC. (FLOW NOZ.)		***	***

FURNACE PERFORMANCE

BURNACE PERFORMANCE		SCRUBBER PERFORMANCE		PART.	VENT ABS.	FLOAT.BFD
HEAT RELEASE,BTU/HR	0.547E 07	SO2 ABSORB.EFF	***	***	79.23	***
% FUEL AS COAL	96.4	FLYASH COL.EFF	***	***	***	***
COAL FLOW RATE,#/HR	433.0	SO3 ABSORB.EFF	***	***	***	***
NAT.GAS FLOW,#/HR	8.8	NOX ABSORB.EFF	***	***	***	***
% EXCESS AIR	14.3	GAS VELOCITY,FPS	152.5	79.5	***	***
OXYGEN,%DRY,MEAS.	3.00	LIQ/GAS,GAL/MCF	15.3	32.7	***	***
CO2,%DRY-CALC.	15.47	LIQ/GAS,#/#	2.1	4.6	***	***
HUMIDITY,#/# - CALC.	0.050	PRES.DROP,IN.WG	4.1	1.6	***	***

SC2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOL/HR-FT2,	=	104.9
SULFITE/SO2-MOL/MOL	=	4.81
SUMP RESID.TIME, MIN	=	8.4

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	*****	CUNC., GR-MOLE/L =	0.1574
SULFITE/SO2-MUL/MOL	=	*****	MOL% TOTAL SULF =	15.93
SUMP RESID.TIME, MIN	=	*****	O2 AT FURN. EX. =	3.00
		*****	O2 AT ABSORB. IN =	*****
		*****	O2 AT ABSORB. EX =	*****

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER K-139

DATE 4-9-70

TIME OF DAY 1730

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROC.
INPUT, #/HR	16.02	-----	32.04	240.9	5228.	INPUT FLOWS, #ATOMS/100:FEED
OUTPUT, #/HR	*****	-----	*****	259.9	5236.	CARBON 0.479570
PART. SCRUBBER						HYDROGEN 0.528871
INPUT, #/HR	*****	-----	*****	1699.	5236.	OXYGEN 1.392784
OUTPUT, #/HR	25.98	-----	*****	3002.	5064.	NITROGEN 5.044497
						SULFUR 0.009115
SO2 ABSORBERS						FEED RATE, #/SEC= 1.53
INPUT, #/HR	25.98	26.57	*****	1221.	5064.	ENTHALPY, BTU/# = -1247.
OUTPUT, #/HR	38.39	28.64	*****	1277.	5551.	

*

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGD COMPOSITION
COMBINED	100ML	LITER	100ML	SLURRY CONC.- GM MGD/100ML = 11.50
FREE	5.90	0.9221	-----	MGD PRESLAKED, NO=0, YES=1 0
	5.90	0.9221	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MUNO(TOTAL)	0.0	0.0	-----	
MUNO(DISSOLVED)	5.90	0.9221	-----	PRODUCT MG BASE PHYSICAL PROPERTIES
MUNO(SOLID)	1.00	0.1563	-----	ACID STRENGTH, PH = 9.20
BISULFITE	4.90	0.7659	1.625	SP.GRAVITY, HYDRON. = 1.0750
MGO	0.0	0.0	16.230	
SULFATE	1.20	0.1878	0.0	
MAGNESIUM	1.01	0.1574	0.751	
FLYASH	8.11	1.2673	1.888	
SOLIDS, MG	-----	-----	-----	PARTICULATE SCRUBBER PRODUCT
				ACID STRENGTH, PH = 2.50
				FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-140	CARD NUMBER	2	CARD NUMBER	3
DATE	4-27-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, RSCALE	0.9900E 02
TIME	1400	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.2000E 01	02 FURN. EX. % - RM	0.5000E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5000E 01	CCMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2500E 01	FURN. EX. ST, H2O	0.2200E 01	ELF. CHEM. MILVCLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BARGMETRIC, HG	0.2887E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1400E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR GRIF.	0.7600E 03	PART. SCRUB. IN	0.4100E 03
ABS NOZ., PSIG	0.2800E 02	WINDBOX-TOP	0.7400E 03	#1 ORIFICE	0.1300E 03
ABS LOAD, PSIG	0.4700E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1300E 03
ABS ORIF. INCH	0.5000E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK CUT	0.6000E 03	PRI. AIR FAN IN.	0.9500E 02
CARD NUMBER	7	NO. 2 BANK CUT	0.5300E 03	PRI. AIR WGT BULB	0.7200E 02
MODE OF OPER.	3	FURN. EXIT	0.3800E 03	SEC. AIR FAN IN.	0.7800E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.6600E 02
PART. SCR. DP, H2O	0.4000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5800E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1200E 01
#1 ORIF. ST, HG	-0.1800E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 ORIF. DP, H2O	0.4400E 01	CARD NUMBER	11	FBA DP, H2O	0.6800E 01
		TEMP. THERMOMETERS, F	0.1320E 03	FBA GENIST. DP, H2O	0.1000E 01
CARD NUMBER	10	PART. CYC. EXIT	0.0	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1100E 03	ABS CYC. EXIT	0.0	MAKEUP FLOWS	
#1 ORIFICE	0.1320E 03	PART. CYC. SUMP	0.1280E 03	PART. INIT. GAL	0.8730E 04
FBA INLET	0.1220E 03	ABS CYC. SUMP	0.0	PART. FINAL. GAL	0.9043E 04
FBA EXIT	0.1220E 03	FBA SUMP	0.1260E 03	PART. TIME, MIN	0.6000E 02
P. P. EXIT	0.1220E 03	MGO SLAK TANK	0.0	ABS H2O IN. GAL	0.3317E 05
PART. CYC. SUMP	0.0	MGOH2 TANK	0.1400E 03	ABS H2O FI. GAL	0.3326E 05
ABS CYC. SUMP	0.1260E 03			ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1080E 03			MGO RUTU. SCALE, %	0.3500E 02
MGO SLAK TANK	0.1380E 03			MAKEUP SETTING	0.3500E 02
MGOH2 TANK	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-140

DATE 4-27-70

TIME OF DAY 1400

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/%	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2C
PRIMARY AIR	496.	120.0	-----	-----	-----	-----	0.013	68.6	490.	17.6
SECONDARY AIR	4905.	747.5	-----	-----	-----	-----	0.012	67.8	4845.	6.0
FURNACE EXIT	5789.	380.0	3070.9	-----	-----	-----	0.051	112.0	5509.	2.2
PART.SCRB.INLET	5789.	410.0	-----	-----	-----	-----	0.051	112.0	-----	2.7
PART.CYC.EXIT	5628.	132.0	2939.3	-----	-----	-----	0.089	127.6	5166.	-24.4
VENT ADS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN	5628.	132.0	*****	*****	*****	*****	0.089	127.6	-----	-16.3
FLOATING BED EX	6041.	122.0	*****	*****	*****	*****	0.082	124.6	-----	-27.1
P.P. EXIT CRIF.	6041.	122.0	37.6	*****	*****	*****	0.082	124.6	5582.	-27.1

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.22	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
PRODUCT LIQ.	128.0	5.09	MAKEUP MGO SL.	*****	60.0 12.0
RECIRCULATED LIQ.	128.0	23.15	PRODUCT LIQ.	*****	138.0 4.4
			REC.(SPRAY NOZ.)	*****	126.0 18.1
			REC.(FLOW NOZ.)	*****	126.0 403.2
				*****	465.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.515E 07
% FUEL AS COAL	96.2
COAL FLOW RATE,#/HR	406.4
NAT.GAS FLOW,#/HR	9.0
% EXCESS AIR	23.8
OXYGEN,% DRY, MEAS.	5.00
CO2,% DRY-CALC.	13.73
HUMIDITY,#/# - CALC.	0.051

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	4.29
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	156.6
LIQ/GAS,GAL/MCF	14.9
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	4.0

VENT ABS.

VENT ABS.	*****
FLGAL.BED	98.72

	12.9
	33.9
	4.6
	6.8

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SO2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 50.7

SULFITE/SO2-MOL/MOL = 8.76

SUMP RESID.TIME,MIN = 12.0

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0466

MOL% TOTAL SULF= 7.06

O2 AT FURN.EX.= 5.00

O2 AT ABSORB.IN= *****

O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-140

DATE 4-27-70

TIME OF DAY 1400

MATERIAL BALANCES

FURNACE

INPUT, #/HR 15.04
OUTPUT, #/HR 17.75

PART. SCRUBBER

INPUT, #/HR 17.75
OUTPUT, #/HR 15.94

SO2 ABSORBERS

INPUT, #/HR 15.94
OUTPUT, #/HR 24.40

* #SO2 ABSORBERS-PRODUCT COMP.

GM SO2/100KL 4.16
GM-MOLE/LITER 0.6465

TOTAL, COMBINED 4.07
FREE 0.08

MONO(TOTAL) 3.99
MONO(DISSOLVED) 1.08

MONO(SOLID) 2.91
BISULFITE 0.16

MGO 0.0
SULFATE 0.30

MAGNESIUM 4.37
FLYASH -----

SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROC.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.420731
HYDROGEN 0.545917
OXYGEN 1.398527
NITROGEN 5.089453
SULFUR 0.008173

FEED RATE, #/SEC= 1.60

ENTHALPY, BTU/# = -162.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 8.80
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MGO(OH)2, NEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.70
SP. GRAVITY, HYDRON. = 1.0390

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	L-141	CARD NUMBER	2	CARD NUMBER	3
DATE	4-27-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, TSCALE	0.9900E 02
TIME	1530	BURNER DP, H2O	0.5500E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCRUB SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1800E 01	02 FURN. EX. % - BM	0.5200E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5200E 01	COMP. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2500E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEN. NITVGLT	0.0
		PEEPSITE DP, HG	0.0	GILL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2687E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LCAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1400E 03	PART. SCRUB. IN	0.4000E 03
ABS NOZ., PSIG	0.2800E 02	WINDBOX-TOP	0.7500E 03	#1 ORIFICE	0.1400E 03
ABS LCAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FJA INLET	0.1400E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6200E 03	PRI. AIR FAN IN.	0.9500E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.5400E 03	PRI. AIR WGT BULB	0.7000E 02
MODE OF OPER.	3	FURN. EXIT	0.3950E 03	SEC. AIR FAN IN.	0.8000E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR	0.1400E 03	SEC. AIR NET BULB	0.6600E 02
PART. SCR. DP, H2O	0.4200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1200E 01
#1 ORIF. ST, HG	-0.1800E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.9000E 00
#1 ORIF. DP, H2O	0.4200E 01			FBA DP, H2O	0.6200E 01
				FBA DEMIST. DP, H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1080E 03	PART. CYC. EXIT	0.1300E 03	PART. INIT. GAL	0.9043E 04
FBA INLET	0.1300E 03	ABS CYC. EXIT	0.0	PART. FINAL. GAL	0.9358E 04
FBA EXIT	0.1220E 03	PART. CYC. SUMP	0.1280E 03	PART. TIME, MIN	0.1300E 03
P. P. EXIT	0.1220E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.3326E 05
PART. CYC. SUMP	0.1220E 03	FBA SUMP	0.1260E 03	ABS H2O FI. GAL	0.3337E 05
ABS CYC. SUMP	0.8800E 02	MGO SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.1300E 03
FBA SUMP	0.1260E 03	MGOH2 TANK	0.1390E 03	MGO ROTU. SCALE, %	0.4000E 02
MGO SLAK TANK	0.1780E 03			MAKEUP SETTING	0.4000E 02
MGOH2 TANK	0.1350E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-141

DATE 4-27-70

TIME OF DAY 1530

FLUE GAS DATA

	FLUE GAS DATA	FLUX #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	477.	140.0	---	---	---	---	---	0.011	64.9	471.	16.3
SECONDARY AIR	4922.	737.5	---	---	---	---	---	0.012	67.0	4864.	6.0
FURNACE EXIT	5782.	395.0	2911.8	22.2	---	---	---	0.050	111.4	5506.	2.2
PART.SCRB.INLET	5782.	400.0	---	---	---	---	---	0.050	111.4	---	2.7
PART.CYC.EXIT	5532.	130.0	2686.7	---	---	---	---	0.073	121.1	5155.	-24.4
VENT ADS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5532.	130.0	---	---	---	---	---	0.073	121.1	---	-16.3
FLOATING BED EX	6216.	122.0	---	---	---	---	---	0.063	116.2	---	-24.4
P.P. EXIT ORIF.	6216.	122.0	25.6	---	---	---	---	0.063	116.2	5849.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	2.42	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	128.0	5.09	MAKEUP MGO SL.	*****	60.0 6.8
PRODUCT LIQ.	128.0	23.15	PRODUCT LIQ.	6.4	135.0 4.8
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	*****	126.0 18.1
			REC.(FLOW NOZ.)	*****	126.0 403.2
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.508E 07
% FUEL AS COAL	96.1
COAL FLOW RATE,#/HR	401.3
NAT.GAS FLOW,#/HR	9.0
% EXCESS AIR	24.8
OXYGEN,% DRY, MEAS.	5.20
CO2,% DRY-CALC.	13.56
HUMIDITY,#/# - CALC.	0.050

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	7.73
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	152.1
LIQ/GAS,GAL/MCF	15.3
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	4.2

FLOAT.BED

99.05

13.0
32.9
4.4
6.2

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOL/HR-FT2	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****

FLOATING BED ABSORBER

KGA,#MOL/HR-FT2	=	56.7
SULFITE/SC2-MOL/MOL	=	6.97
SUMP RESID.TIME,MIN	=	12.0

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L	=	0.0397
MOL% TOTAL SULF	=	6.19
O2 AT FURN.EX	=	5.20
O2 AT ABSORB.IN	=	*****
O2 AT ABSORB.EX	=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-141

DATE 4-27-70

TIME OF DAY 1530

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	14.85	-----	29.70	256.6	5499.	
OUTPUT, #/HR	16.84	-----	*****	275.9	5506.	
PART. SCRUBBER						
INPUT, #/HR	16.84	-----	*****	1488.	5506.	
OUTPUT, #/HR	14.54	-----	*****	2926.	5155.	

SO2 ABSORBERS

INPUT, #/HR	14.54	*****			
OUTPUT, #/HR	23.62	16.85	*****	1071.	5155.
			*****	1375.	5849.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
COMBINED	4.07	0.6358	-----	SLURRY CONC.- GM MGO/100ML = *****
FREE	3.88	0.6061	-----	MGO PRESLAKED, NO=0, YES=1 *****
MUNO(TOTAL)	0.19	0.0296	-----	% SLAKED TO MG(OH)2, NEAS. = *****
MUNO(DISSOLVED)	3.69	0.5765	-----	
MUNO(SOLID)	0.84	0.1312	-----	
BISULFITE	2.85	0.4452	1.365	PRODUCT MGO BASE PHYSICAL PROPERTIES
MGO	0.36	0.0281	9.439	ACID STRENGTH, PH = 6.80
SULFATE	0.0	0.0	0.523	SP.GRAVITY, HYDRUM. = 1.0350
MAGNESIUM	0.25	0.0397	0.0	
FLYASH	4.13	0.6458	0.476	
SOLIDS, MG	-----	-----	*****	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.425761
 HYDROGEN 0.526213
 OXYGEN 1.399107
 NITROGEN 5.094028
 SULFUR 0.008076

FEED RATE, #/SEC= 1.60

ENTHALPY, BTU/# = 74.

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-142	CARD NUMBER	2	CARD NUMBER	3
DATE	4-27-70	WINDBOX ST, H2O	0.7000E 01	N.G. FLOW, %SCALE	0.9900E 02
TIME	1700	BURNER DP, H2O	0.5000E 01	N.G. STATIC, R.O.	0.6400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1800E 01	G2 FURN. EX. 2-BM	0.5700E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5000E 01	CLMP. FURN. EX. 2	0.0
SEC. AIR DP, H2O	0.2500E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVULT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2881E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1400E 03	TEMP. CONTINUED	0.3900E 03
PART. LOAD, PSIG	0.4200E 02	SEC. AIR DRIF.	0.7500E 03	PART. SCRUB. IN	0.1400E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7200E 03	#1 ORIFICE	0.1450E 03
ABS LOAD, PSIG	0.4800E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.8500E 03
ABS ORIF. INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.6300E 03	AIR HEATER #2	0.9500E 02
MANOMETER CODE	0	NO. 1 BANK OUT	0.5300E 03	PRI. AIR FAN IN.	0.7000E 02
		NO. 2 BANK OUT	0.3950E 03	PRI. AIR WGT BULB	0.8000E 02
CARD NUMBER	7	FURN. EXIT	0.1400E 03	SEC. AIR FAN IN.	0.6600E 02
MODE OF OPER.	3	COAL-AIR		SEC. AIR WGT BULB	0.6600E 02
PART. SCR. ST, HG	0.2000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.4600E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1200E 01
PART. CYC. DP, H2O	0.6000E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 ORIF. ST, HG	-0.1000E 01			FBA DP, H2O	0.6600E 01
#1 GRIF. DP, H2O	0.4200E 01			FBA DEMIST. DP, H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILCT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1120E 03	PART. CYC. EXIT	0.1300E 03	PART. INIT. GAL	0.9353E 04
FBA INLET	0.1300E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.9456E 04
FBA EXIT	0.1220E 03	PART. CYC. SUMP	0.1280E 03	PART. TIME, MIN	0.2000E 02
P. P. EXIT	0.1220E 03	ABS CYC. SUMP	0.0	ABS H2O IN, GAL	0.3337E 05
PART. CYC. SUMP	0.1220E 03	FBA SUMP	0.1250E 03	ABS H2O FI, GAL	0.3339E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.2000E 02
FBA SUMP	0.1250E 03	MGOH2 TANK	0.1330E 03	MGO ROTO. SCALE, %	0.4000E 02
MGO SLAK TANK	0.1760E 03			MAKEUP SETTING	0.4000E 02
MGOH2 TANK	0.1300E 03				
MAKEUP WATER	0.6000E 02				

RUN NUMBER L-142 DATE 4-27-70 TIME OF DAY 1700

FLUE GAS DATA										
	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. %/H	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	487.	140.0	---	---	---	---	0.011	64.9	481.	16.3
SECONDARY AIR	4917.	730.0	---	---	---	---	0.012	67.1	4859.	7.0
FURNACE EXIT	5775.	395.0	2632.8	*****	*****	*****	0.049	110.6	5505.	2.2
PART.SCRB.INLET	5775.	390.0	*****	*****	*****	*****	0.049	110.6	---	2.7
PART.CYC.EXIT	5589.	130.0	2477.6	*****	*****	*****	0.081	125.5	5168.	-13.5
VENT.ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS.CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5589.	130.0	*****	*****	*****	*****	0.081	125.5	---	-16.3
FLOATING BED EX	6064.	122.0	*****	*****	*****	*****	0.074	121.3	---	-24.4
P.P. EXIT ORIF.	6064.	122.0	16.3	*****	*****	*****	0.074	121.3	5648.	-24.4

SCRUBBER STREAM DATA					VENTURI ABSORBER				
	TEMP,F	FLOW,GPM	GAS ABSORBER		TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M	FINA
PARTICULATE	60.0	4.90	MAKEUP WATER		*****	*****	60.0	11.5	
MAKEUP WATER	128.0	5.09	MAKEUP N2O SL.		*****	6.4	130.0	4.8	
PRODUCT LIQ.	128.0	23.15	PRODUCT LIQ.		*****	*****	125.0	18.1	
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)		*****	*****	125.0	394.7	
			REC.(FLOW NOZ.)		*****	*****		446.1	

FURNACE PERFORMANCE									
HEAT RELEASE,BTU/HR	0.493E 07	SCRUBBER PERFORMANCE							
% FUEL AS COAL	96.0	SO2 ABSORB.EFF	5.90	VENT.ABS.	*****	FLOAT.BED	60.34		
COAL FLOW RATE,#/HR	388.7	FLYASH COL.EFF	*****	*****	*****	*****	*****		
NAT.GAS FLOW,#/HR	8.9	SO3 ABSORB.EFF	*****	*****	*****	*****	*****		
% EXCESS AIR	27.1	NOX ABSORB.EFF	*****	*****	*****	*****	*****		
OXYGEN,% DRY, MEAS.	5.70	GAS VELOCITY,FPS	150.5	*****	*****	*****	12.8		
CO2,% DRY-CALC.	13.12	LIQ/GAS,GAL/MCF	15.5	*****	*****	*****	32.6		
HUMIDITY,#/# - CALC.	0.049	LIQ/GAS,#/#	2.1	*****	*****	*****	4.4		
		PRES.DROP,IN.WG	4.6	*****	*****	*****	6.6		

S02 ABSORPTION PARAMETERS									
VENTURI ABSORBER									
KGA,#MOLE/HR-FT2,	=	*****	FLOATING BED ABSORBER						
SULFITE/SO2-MOL/MOL	=	*****	KGA,#MOLE/HR-FT2	59.2	SULFATE FORMATION PARAMETERS				
SUMP RESID.TIME,MIN	=	*****	SULFITE/SO2-MOL/MOL	6.19	CUNC.,GM-MOLF/L=	0.0360			
***** MEANS ITEM NOT MEASURED			SUMP RESID.TIME,MIN	12.0	NULY TOTAL SULF=	6.50			
					O2 AT FURN. EX.=	5.70			
					O2 AT ABSORB.IN=	*****			
					O2 AT ABSORB.EX=	*****			

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-142

DATE 4-27-70

TIME OF DAY 1700

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	14.38	-----	28.77	250.8	5499.	
OUTPUT, #/HR	15.25	-----	*****	270.1	5505.	
PART. SCRUBBER						
INPUT, #/HR	15.25	-----	*****	2722.	5505.	
OUTPUT, #/HR	13.47	-----	*****	2970.	5168.	
SO2 ABSORBERS						
INPUT, #/HR	13.47	*****	*****	1396.	5168.	
OUTPUT, #/HR	20.06	14.48	*****	1433.	5648.	

*

*SO2 ABSORBERS- PRODUCT CUMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGD COMPOSITION
COMBINED	100ML	LITER	100ML	SLURRY CONC.- GM MGD/100ML =
FREE	3.45	0.5385	-----	MGD PRESLAKED, NO=0, YES=1
MONO(TOTAL)	3.32	0.5191	-----	% SLAKED TO MG(OH)2, MEAS. =
MONO(DISSOLVED)	0.12	0.0195	-----	
MONO(SOLID)	3.20	0.4996	-----	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	0.68	0.1062	-----	ACID STRENGTH, PH =
MGO	2.52	0.3934	1.105	SP.GRAVITY, HYDRUM. =
SULFATE	0.44	0.0344	8.339	
MAGNESIUM	0.0	0.0	0.635	
FLYASH	0.23	0.0360	0.0	
SOLIDS, MG	3.55	0.5551	0.432	
	-----	-----	-----	
	-----	-----	6.582	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.413293
HYDROGEN	0.515667
OXYGEN	1.400562
NITROGEN	5.105508
SULFUR	0.007834

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 156.

0

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-143	CARD NUMBER	2	CARD NUMBER	3
DATE	4-27-70	WINDBOX ST, H2O	0.6700E 01	N.G. FLOW, ZSCALE	0.9300E 02
TIME	2030	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1150E 01	FURN. ST, H2O	0.1000E 01	SCREW SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1700E 01	C2 FURN. EX. % - BM	0.5600E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.3400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CFLT TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2881E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.3900E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4000E 02	SEC. AIR ORIF.	0.1250E 03	PART. SCRUB. IN	0.4250E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7550E 03	#1 ORIFICE	0.1450E 03
ABS LOAD, PSIG	0.4800E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1350E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BCT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6550E 03	PRI. AIR FAN IN.	0.9200E 02
		NO. 2 BANK OUT	0.5600E 03	PRI. AIR WGT BULB	0.7000E 02
CARD NUMBER	7	FURN. EXIT	0.4100E 03	SEC. AIR FAN IN.	0.6800E 02
MODE CF OPER.	3	COAL-AIR	0.1300E 03	SEC. AIR WET BULB	0.6100E 02
PART. SCR. ST, HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.4800E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1100E 01
PART. CYC. DP, H2O	0.5800E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.8000E 00
#1 URIF. ST, HG	-0.8000E 00			FBA DP, H2O	0.6200E 01
#1 URIF. DP, H2O	0.4000E 01			FBA DEMIST. DP, H2O	0.9000E 00
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1100E 03	PART. CYC. EXIT	0.1320E 03	PART. INIT. GAL	0.1033E 05
FBA INLET	0.1320E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.1054E 05
FBA EXIT	0.1240E 03	PART. CYC. SUMP	0.1290E 03	PART. TIME, MIN	0.4000E 02
P.P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.3379E 05
PART. CYC. SUMP	0.1240E 03	FBA SUMP	0.1290E 03	ABS H2O FI. GAL	0.3385E 05
ABS CYC. SUMP	0.8300E 02	MGO SLAK TANK	0.1200E 03	ABS H2O TIME, MIN	0.4000E 02
FBA SUMP	0.1290E 03	MGOH2 TANK	0.1410E 03	MGO ROTO. SCALE, %	0.3600E 02
MGO SLAK TANK	0.1140E 03			MAKEUP SETTING	0.3600E 02
MGOH2 TANK	0.1370E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-143

DATE 4-27-70

TIME OF DAY 2030

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.38	-----	28.75	246.1	5460.
OUTPUT, #/HR	16.92	-----	*****	265.1	5466.
PART. SCRUBBER					
INPUT, #/HR	16.92	-----	*****	2963.	5466.
OUTPUT, #/HR	15.30	-----	*****	2922.	4991.

SO2 ABSORBERS

INPUT, #/HR	15.30	15.05	*****	1383.	4991.
OUTPUT, #/HR	15.30	11.63	*****	1417.	4607.

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGD COMPOSITION
COMBINED	2.57	0.4010	-----	SLURRY CONC. - GM MGD/100ML = 9.30
FREE	2.57	0.4010	-----	MGD PRESLAKED, NO=0, YFS=1
MONO(TOTAL)	0.0	0.0	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	2.57	0.4010	-----	
MONO(SOLID)	1.16	0.1812	-----	
BISULFITE	1.41	0.2198	1.885	
MGO	0.0	0.0	4.659	
SULFATE	0.06	0.0096	0.0	
MAGNESIUM	0.22	0.0351	0.038	
FLYASH	2.85	0.4457	0.421	
SOLIDS, MG	-----	-----	-----	

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.40
SP. GRAVITY, HYDROM. = 1.0380

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	L-144	CARD NUMBER	2	CARD NUMBER	3
DATE	4-27-70	WINDBOX ST, H2O	0.6300E 01	N.G. FLOW, WSCALE	0.9800E 02
TIME	2230	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.7600E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1000E 01	SCRUB SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2100E 01	PP EXIT ST, HG	-0.1800E 01	02 FURN. EX. % - BM	0.5700E 01
SEC. AIR ST, HG	0.2350E 01	PP EXIT DP, H2O	0.3500E 01	CONR. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2450E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEM. FILVCLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2881E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.2650E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4000E 02	SEC. AIR URIF.	0.1300E 03	PART. SCRUB. IN	0.4300E 03
ABS NOZ., PSIG	0.3900E 02	WINDBOX - TOP	0.7500E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.4800E 02	WINDBOX - WEST	0.7300E 03	FBA INLET	0.1300E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX - BUT.	0.7300E 03	AIR HEATER #1	0.2500E 03
ABSORBER NOZ. CODE	1	WINDBOX - EAST	0.7400E 03	AIR HEATER #2	0.3500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6700E 03	PRI. AIR FAN IN.	0.8800E 02
		NO. 2 BANK OUT	0.5750E 03	PRI. AIR WGT BULB	0.6900E 02
CARD NUMBER	7	FURN. EXIT	0.4200E 03	SEC. AIR FAN IN.	0.6800E 02
MODE OF OPER.	3	COAL - AIR	0.1300E 03	SEC. AIR WLT BULB	0.6100E 02
PART. SCR. ST, HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.5200E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1100E 01
PART. CYC. DP, H2O	0.5800E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.8000E 00
#1 ORIF. ST, HG	-0.8000E 00			FBA DP, H2O	0.6200E 01
#1 ORIF. DP, H2O	0.3800E 01			FBA DENIST. DP, H2O	0.9000E 00
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1080E 03	PART. CYC. EXIT	0.1340E 03	PART. INIT. GAL	0.1076E 05
FBA INLET	0.1340E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.1106E 05
FBA EXIT	0.1230E 03	PART. CYC. SUMP	0.1290E 03	PART. TIME, MIN	0.6000E 02
P.P. EXIT	0.1230E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.3391E 05
PART. CYC. SUMP	0.1240E 03	FBA SUMP	0.1290E 03	ABS H2O FI. GAL	0.3399E 05
ABS CYC. SUMP	0.8000E 02	MGO SLAK TANK	0.2040E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1290E 03	MGOCH2 TANK	0.1340E 03	MGO ROTO. SCALE, %	0.3600E 02
MGO SLAK TANK	0.2010E 03			MAKEUP SETTING	0.3600E 02
MGOCH2 TANK	0.1300E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-144

DATE 4-27-70

TIME OF DAY 2230

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	14.52	-----	29.04	248.8	5546.	INPUT FLOWS, #ATONS/1004FEED
OUTPUT, #/HR	17.97	-----	*****	267.8	5552.	CARBON 0.413413
PART. SCRUBBER						HYDROGEN 0.522227
INPUT, #/HR	17.97	-----	*****	2926.	5552.	OXYGEN 1.400574
OUTPUT, #/HR	15.52	-----	*****	2911.	4853.	NITROGEN 5.105390
SO2 ABSORBERS						SULFUR 0.007841
INPUT, #/HR	15.52	15.05	*****	1370.	4853.	FEED RATE, #/SEC= 1.61
OUTPUT, #/HR	16.82	12.53	*****	1414.	4666.	ENTHALPY, BTU/# = 805.

*SO2 ABSORBERS- PRODUCT COMP.

	GM SU2/ 100ML	GM-MULE/ LITER	GRAM/ 100ML
TOTAL,	2.78	0.4338	-----
COMBINED	2.78	0.4338	-----
FREE	0.0	0.0	-----
MONO(TOTAL)	2.78	0.4338	-----
MONO(DISSOLVED)	0.88	0.1375	1.430
MONO(SOLID)	1.90	0.2963	6.282
BISULFITE	0.32	0.0250	0.465
MGO	0.0	0.0	0.0
SULFATE	0.30	0.0461	0.554
MAGNESIUM	3.07	0.4800	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	*****

MAKEUP H2O COMPOSITION

SLURRY CONC. - GA H2O/100ML = 9.30
MGO PRE-SLAKED, NU=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.50
SP. GRAVITY, HYDROM. = 1.0370

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-145	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-70	WINDBOX ST,H20	0.6800E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	0030	BURNER DP,H20	0.6500E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H20	0.1000E 01	SCREW SPEED,RPM	0.4000E 03
PRI.AIR DP,H20	0.2100E 01	PP EXIT ST,HG	-0.1700E 01	O2 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H20	0.3400E 01	CUMB.FURN,EX.%	0.0
SEC.AIR DP,H20	0.2400E 01	FURN.EX.ST,H20	0.1000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2881E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.2650E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4000E 02	SEC.AIR ORIF.	0.1200E 03	PART.SCRUB.IN	0.4400E 03
ABS NOZ.,PSIG	0.3900E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1250E 03
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 HANK OUT	0.6850E 03	PRI.AIR FAN IN.	0.8500F 02
		NO.2 HANK OUT	0.5900E 03	PRI.AIR WGT BULB	0.6700E 02
CARD NUMBER	7	FURN. EXIT	0.4250E 03	SEC.AIR FAN IN.	0.5800E 02
MODE OF OPER.	3	COAL-AIR	0.1200E 03	SEC.AIR WET BULB	0.5500E 02
PART.SCR.ST,HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H20	0.5000E 01	VENT.ABS.DP,H20	0.0	FBA INLET ST,HG	-0.1000E 01
PART.CYC.DP,H20	0.5800E 01	ABS CYC.DP,H20	0.0	FBA SUMP DP,H20	0.8000E 00
#1 ORIF.ST,HG	-0.8000E 00			FBA DP,H20	0.6100E 01
#1 ORIF.DP,H20	0.4000E 01			FBA DEMIST.DP,H20	0.9000E 00
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1220E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.1136E 05
FBA INLET	0.1340E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.1168E 05
FBA EXIT	0.1240E 03	PART.CYC.SUMP	0.1290E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1240E 03	ABS CYC.SUMP	0.0	ABS H20 IN.GAL	0.3405E 05
PART.CYC.SUMP	0.1240E 03	FBA SUMP	0.1290E 03	ABS H20 FI.GAL	0.3411E 05
ABS CYC.SUMP	0.7800E 02	MGD SLAK TANK	0.2060E 03	ABS H20 TIME,MIN	0.6000E 02
FBA SUMP	0.1290E 03	MGU2 TANK	0.1250E 03	MGD ROTO.SCALE,%	0.3600E 02
MGU SLAK TANK	0.2020E 03			MAKEUP SETTING	0.3600E 02
MGU2 TANK	0.1240E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-145

DATE 4-28-70

TIME OF DAY 0030

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	463.	120.0	---	---	---	---	0.011	64.5	458.	16.3
SECONDARY AIR	4904.	747.5	---	---	---	---	0.010	60.4	4857.	6.8
FURNACE EXIT	5734.	425.0	3026.0	---	---	---	0.047	108.9	5478.	1.0
PART.SCRB.INLET	5734.	440.0	---	---	---	---	0.047	108.9	---	1.4
PART.CYC.EXIT	5438.	134.0	2997.7	---	---	---	0.093	129.9	4977.	-10.8
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5438.	134.0	*****	*****	*****	*****	0.093	129.9	---	-13.5
FLOATING BED EX	4989.	124.0	*****	*****	*****	*****	0.082	124.8	---	-23.0
P.P. EXIT ORIF.	4989.	124.0	18.1	*****	*****	*****	0.082	124.8	4611.	-23.0

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M
PARTICULATE	60.0	5.33	MAKEUP WATER	*****	60.0	8.9
MAKEUP WATER	129.0	4.92	MAKEUP MGD SL.	6.4	124.0	4.5
PRODUCT LIQ.	129.0	18.52	PRODUCT LIQ.	*****	129.0	18.1
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	129.0	486.9
			REC.(FLOW NOZ.)	*****		455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.488E 07
% FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	384.4
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	27.6
OXYGEN,% DRY, MEAS.	5.80
CO2,% DRY-CALC.	13.04
HUMIDITY,#/# - CALC.	0.047

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	0.93
FLYASH CUL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	147.4
LIQ/GAS,GAL/MCF	12.7
LIQ/GAS,#/#	1.7
PRES.DROP,IN.WG	5.0

VENT ABS.

FLOAT.BED

99.39

10.6
40.3
5.5
6.1

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	49.2
SULFITE/SO2-MOL/MOL	=	9.03
SUMP RESID.TIME,MIN	=	10.6

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0443
MOL% TOTAL SULF=	9.11
O2 AT FURN.EX.=	5.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-145

DATE 4-28-70

TIME OF DAY 0030

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	14.22	---	---	28.45	236.3	5472.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	17.45	---	---	*****	255.3	5478.	CARBON 0.410820
							HYDROGEN 0.511758
							OXYGEN 1.400857
PART. SCRUBBER							NITROGEN 5.107782
INPUT, #/HR	17.45	---	---	*****	2921.	5478.	SULFUR 0.007787
OUTPUT, #/HR	15.70	---	---	*****	2924.	4977.	

SO2 ABSORBERS

INPUT, #/HR	15.70	15.05	*****	1240.	4977.	FEED RATE, #/SEC = 1.59
OUTPUT, #/HR	17.62	13.17	*****	1401.	4611.	ENTHALPY, BTU/# = 1813.

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	2.95	0.4605	---	MAKEUP MGO COMPOSITION
COMBINED	2.95	0.4605	---	SLURRY CONC.- GM MGO/100ML = 9.30
FREE	0.0	0.0	---	MGO PRESLAKED, NO=0, YES=1
MONO(TOTAL)	2.95	0.4605	---	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	0.96	0.1500	---	
MONO(SOLID)	1.99	0.3105	1.560	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	0.20	0.0156	6.582	ACID STRENGTH, PH = 7.30
MGO	0.0	0.0	0.291	SP.GRAVITY, HYDRUM. = 1.0380
SULFATE	0.28	0.0443	0.0	
MAGNESIUM	3.23	0.5048	0.532	PARTICULATE SCRUBBER PRODUCT
FLYASH	---	---	---	ACID STRENGTH, PH = *****
SOLIDS, MG	---	---	*****	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-146	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-70	WINDBOX ST,H2O	0.6400E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	0300	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1100E 01	FURN. ST,H2O	0.1000E 01	SCREW SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1700E 01	O2 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.3500E 01	CCMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX.ST,H2O	0.1000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2880E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.3900E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4000E 02	SEC.AIR ORIF.	0.1300E 03	PART.SCRUB.IN	
ABS NCZ.,PSIG	0.2650E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.4500E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7350E 03	FBA INLET	0.1500E 03
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.7350E 03	AIR HEATER #1	0.1300E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.1500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7000E 03	PRI.AIR FAN IN.	0.8400E 02
		NO.2 BANK OUT	0.6000E 03	PRI.AIR WGT BULB	0.6600E 02
CARD NUMBER	7	FURN. EXIT	0.4350E 03	SEC.AIR FAN IN.	0.6600E 02
MODE OF OPER.	3	COAL-AIR	0.1250E 03	SEC.AIR WET BULB	0.6100E 02
PART.SCR.ST,HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.5100E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
PART.CYC.DP,H2O	0.5700E 01	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
#1 DRIF.ST,HG	-0.9000E 00			FBA DP,H2O	0.6200E 01
#1 ORIF.DP,H2O	0.3900E 01			FBA DEMIST.DP,H2O	0.9000E 00
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1200E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.1220E 05
FBA INLET	0.1340E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.1252E 05
FBA EXIT	0.1250E 03	PART.CYC.SUMP	0.1290E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3421E 05
PART.CYC.SUMP	0.1250E 03	FBA SUMP	0.1290E 03	ABS H2O FI.GAL	0.3426E 05
ABS CYC.SUMP	0.8000E 02	MGO SLAK TANK	0.1080E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1290E 03	MGOH2 TANK	0.1490E 03	MGO ROTO.SCALE,%	0.3800E 02
MGO SLAK TANK	0.1050E 03			MAKEUP SETTING	0.3800E 02
MGOH2 TANK	0.1460E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-146

DATE 4-28-70

TIME OF DAY 0300

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	492.	125.0	---	---	---	---	0.011	63.2	487.	14.9
SECONDARY AIR	4858.	595.0	---	---	---	---	0.012	65.8	4803.	6.4
FURNACE EXIT	5716.	435.0	2954.6	---	---	---	0.048	110.0	5452.	1.0
PART.SCRB.INLET	5716.	450.0	---	---	---	---	0.048	110.0	---	1.4
PART.CYC.EXIT	5353.	134.0	2881.3	---	---	---	0.097	131.2	4881.	-12.2
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5353.	134.0	*****	*****	*****	*****	0.097	131.2	---	-14.9
FLOATING BED EX	5051.	125.0	*****	*****	*****	*****	0.086	126.2	---	-23.0
P.P. EXIT ORIF.	5051.	125.0	8.9	*****	*****	*****	0.086	126.2	4653.	-23.0

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.33	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	129.0	4.92	MAKEUP MGO SL.	*****	60.0
PRODUCT LIQ.	129.0	22.84	PRODUCT LIQ.	6.4	146.0
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	129.0
			REC.(FLOW NOZ.)	*****	129.0
				*****	390.4
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.485E 07
% FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	382.6
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	27.6
OXYGEN,% DRY, MEAS.	5.80
CO2,% DRY-CALC.	13.04
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	2.48
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	146.0
LIQ/GAS,GAL/MCF	15.8
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.1

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = *****
 SULFITE/SC2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2 = 56.1
 SULFITE/SO2-MOL/MOL = 8.93
 SUMP RESID.TIME,MIN = 10.6

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L= 0.0406
 MOL% TOTAL SULF= 7.28
 O2 AT FURN.EX.= 5.80
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

VENT ABS.

PART.

2.48

SO2 ABSORB.EFF

96.0
382.6
8.8
27.6
5.80
13.04
0.048

0.485E 07

HEAT RELEASE,BTU/HR

99.69

10.8
 39.7
 5.4
 6.2

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-146

DATE 4-28-70

TIME OF DAY 0300

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.15	-----	28.31	244.5	5446.
OUTPUT, #/HR	16.95	-----	*****	263.5	5452.
PART. SCRUBBER					
INPUT, #/HR	16.95	-----	*****	2932.	5452.
OUTPUT, #/HR	14.80	-----	*****	2935.	4881.

SO2 ABSORBERS

INPUT, #/HR	14.80	13.20	*****	1150.	4881.
OUTPUT, #/HR	20.35	16.88	*****	1413.	4653.

FEED RATE, #/SEC = 1.58

ENTHALPY, BTU/# = -2777.

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	100ML	LITER	100ML	SLURRY CONC.- GM MGO/100ML = 7.90
FREE	3.48	0.5440	-----	MGO PRESLAKED, NO=0, YES=1 1
MONO(TOTAL)	3.48	0.5440	-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	0.92	0.1437	-----	
MONO(SOLID)	2.56	0.4002	1.495	
BISULFITE	0.0	0.0	8.485	
MGO	0.40	0.0623	0.0	
SULFATE	0.26	0.0406	0.249	
MAGNESIUM	4.14	0.6468	0.487	
FLYASH	-----	-----	-----	
SOLIDS, MG	-----	-----	*****	

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.50
SP.GRAVITY, HYDRUM. = 1.0400

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-147	CARD NUMBER	3
DATE	4-28-70	N.G. FLOW,%SCALE	0.9800E 02
TIME	0530	N.G. STATIC,R.D.	0.8500E 01
PRI.AIR ST, HG	0.1200E 01	SCRFW SPEED,RPM	0.3900E 03
PRI.AIR DP,H2O	0.2400E 01	02 FURN.EX.%-BM	0.5800E 01
SEC.AIR ST,HG	0.1400E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	ELE.CHEM.MILVOLT	0.0
		CELL TEMP,F	0.0
		BAROMETRIC,HG	0.2878E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.3900E 02	TEMP.FURN.RECORDER,F	0.1050E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4000E 02	SEC.AIR ORIF.	0.7600E 03	PART.SCRUB.IN	0.4700E 03
ABS NOZ.,PSIG	0.2600E 02	WINDBOX-TOP	0.7300E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1150E 03
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.7450E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7250E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6200E 03	PRI.AIR FAN IN.	0.8000E 02
		NO.2 BANK OUT	0.4500E 03	PRI.AIR WGT BULB	0.6700E 02
CARD NUMBER	7	FURN. EXIT	0.1050E 03	SEC.AIR FAN IN.	0.6200E 02
MODE OF OPER.	3	CUAL-AIR		SEC.AIR WET BULB	0.5900E 02
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.5200E 01				
PART.CYC.DP,H2O	0.5800E 01				
#1 ORIF.ST,HG	-0.9000E 00				
#1 ORIF.DP,H2O	0.3900E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
		FBA DP,H2O	0.6200E 01
		FBA DEMIST.DP,H2O	0.9000E 00

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1010E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.1281E 05
FBA INLET	0.1340E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.1320E 05
FBA EXIT	0.1250E 03	PART.CYC.SUMP	0.1290E 03	PART.TIME,MIN	0.7500E 02
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3429E 05
PART.CYC.SUMP	0.1260E 03	FBA SUMP	0.1300E 03	ABS H2O FI.GAL	0.3438E 05
ABS CYC.SUMP	0.7600E 02	MGO SLAK TANK	0.1700E 03	ABS H2O TIME,MIN	0.7500E 02
FBA SUMP	0.1300E 03	MGOH2 TANK	0.1370E 03	MGO ROTO.SCALE,%	0.3500E 02
MGO SLAK TANK	0.1680E 03			MAKEUP SETTING	0.3500E 02
MGOH2 TANK	0.1340E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-147

DATE 4-28-70

TIME OF DAY 0530

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	501.	105.0	---	---	---	---	0.012	67.1	495.	16.3
SECONDARY AIR	4964.	741.3	---	---	---	---	0.011	64.7	4909.	6.6
FURNACE EXIT	5838.	450.0	3073.0	---	---	---	0.048	109.8	5570.	1.0
PART.SCRB.INLET	5838.	470.0	---	---	---	---	0.048	109.8	---	1.4
PART.CYC.EXIT	5345.	134.0	3010.4	---	---	---	0.101	132.5	4854.	-12.2
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5345.	134.0	*****	*****	*****	*****	0.101	132.5	---	-14.9
FLOATING BED EX	4970.	125.0	*****	*****	*****	*****	0.091	127.9	---	-23.0
P.P. EXIT ORIF.	4970.	125.0	21.7	*****	*****	*****	0.091	127.9	4558.	-23.0

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	5.22	---	*****	60.0
MAKEUP WATER	129.0	4.92	MAKEUP MGD SL.	6.4	134.0
PRODUCT LIQ.	129.0	22.84	PRODUCT LIQ.	*****	130.0
RECIRCULATED LIQ.			REC.(SPRAY NOZ)	*****	130.0
			REC.(FLOW NOZ.)	*****	386.0
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.496E 07
% FUEL AS COAL	96.1
COAL FLOW RATE,#/HR	391.1
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	27.6
OXYGEN,% DRY, MEAS.	5.80
CO2,% DRY-CALC.	13.04
HUMIDITY,#/# - CALC.	0.048

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	2.04
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	146.2
LIQ/GAS,GAL/MCF	15.7
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.2

VENT ABS.

FLOAT.BED	99.28

	10.6
	40.2
	5.5
	6.2

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FT2,	=	*****	KGA,#MOLE/HR-FT2	=	46.9
SULFITE/SO2-MCL/MOL	=	*****	SULFITE/SO2-MCL/MOL	=	10.24
SUMP RESID.TIME,MIN	=	*****	SUMP RESID.TIME,MIN	=	10.6
***** MEANS ITEM NOT MEASURED					
CONC.,GM-MOLE/L=			CONC.,GM-MOLE/L=		0.0461
MOL% TOTAL SULF=			MOL% TOTAL SULF=		7.07
O2 AT FURN.EX.=			O2 AT FURN.EX.=		5.80
O2 AT ABSORB.IN=			O2 AT ABSORB.IN=		*****
O2 AT ABSORB.EX=			O2 AT ABSORB.EX=		*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-147 DATE 4-28-70 TIME OF DAY 0530

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.47	---	---	28.94	248.5	5564.
OUTPUT, #/HR	18.01	---	---	*****	267.6	5570.
PART. SCRUBBER						
INPUT, #/HR	18.01	---	---	*****	2880.	5570.
OUTPUT, #/HR	15.38	---	---	*****	2953.	4854.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.410913
 HYDROGEN 0.522121
 OXYGEN 1.400866
 NITROGEN 5.107692
 SULFUR 0.007792

FEED RATE, #/SEC = 1.61

SO2 ABSORBERS		SO2	GM-MOLE/LITER	GRAM/100ML	ENTHALPY, BTU/#
INPUT, #/HR	15.38	12.41	*****	1318.	4854.
OUTPUT, #/HR	24.10	18.45	*****	1417.	4558.

* SO2 ABSORBERS-PRODUCT COMP.
 TOTAL, 4.12
 COMBINED 4.12
 FREE 0.0
 MONO(TOTAL) 4.12
 MONO(DISSOLVED) 1.08
 MONO(SOLID) 3.04
 BISULFITE 0.0
 MGO 0.11
 SULFATE 0.30
 MAGNESIUM 4.53
 FLYASH ---
 SOLIDS, MG ---

MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML = 7.80
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 7.50
 SP. GRAVITY, HYDROM. = 1.0370

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-148	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-70	WINDBOX ST,H2O	0.6000E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	0930	BURNER DP,H2O	0.6000E 01	N.G. STATIC,K.O.	0.8400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX,%-BM	0.4800E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.4500E 01	COMB.FURN.EX,%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX,ST,H2O	0.2200E 01	ELE.CHEM.NILVULT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2880E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1200E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR URIF.	0.7600E 03	PART.SCRUB.IN	0.4000E 03
ABS NOZ.,PSIG	0.2500E 02	WINDBOX-TOP	0.7400E 03	#1 CRIFICE	0.1400E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1300E 03
ABS CRIF.INCH	0.4500E 01	WINDBOX-EAST	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	NU.1 BANK OUT	0.6400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NU.2 BANK OUT	0.5600E 03	PRI.AIR FAN IN.	0.8700E 02
CARD NUMBER	7	FURN. EXIT	0.4050E 03	PRI.AIR WGT BULB	0.7200E 02
MODE OF OPER.	3	COAL-AIR	0.1200E 03	SEC.AIR FAN IN.	0.7000E 02
PART.SCR.ST,HG	0.2000E 00	CARD NUMBER	8	SEC.AIR WET BULB	0.6500E 02
PART.SCR.DP,H2O	0.5200E 01	VENT.ABS.DP,H2O	0.0		
PART.CYC.DP,H2O	0.6200E 01	ABS CYC.DP,H2O	0.0	CARD NUMBER	9
#1 URIF.ST,HG	-0.1800E 01			FBA INLET ST,HG	-0.1200E 01
#1 URIF.DP,H2O	0.4400E 01			FBA SUMP DP,H2O	0.9000E 00
				FBA DP,H2O	0.6200E 01
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1000E 03	TEMP.THERMOMETERS,F	0.1300E 03	MAKEUP FLOWS	
#1 CRIFICE	0.1300E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.1452E 05
FBA INLET	0.1240E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.1559E 05
FBA EXIT	0.1240E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.2400E 03
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3469E 05
PART.CYC.SUMP	0.7700E 02	FBA SUMP	0.0	ABS H2O FI.GAL	0.3495E 05
ABS CYC.SUMP	0.1280E 03	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.2400E 03
FBA SUMP	0.0	MGOH2 TANK	0.0	MGO RJTD.SCALE,%	0.3000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.3000E 02
MGOH2 TANK	0.0				
MAKEUP WATER	0.6000E 02				

HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
0.014	72.2	477.	16.3
0.013	70.1	4833.	6.0
0.052	112.9	5484.	2.2
0.052	112.9	---	2.7
0.084	125.7	5201.	-24.4
***	***	---	***
***	***	---	***
0.084	125.7	---	-16.3
0.081	124.3	---	-24.4
0.081	124.3	5310.	-24.4

IN.H2O	#/HR	F
16.3	477.	0.014
6.0	4833.	0.013
2.2	5484.	0.052
2.7	---	0.052
-24.4	5201.	0.084
***	---	***
***	---	***
-16.3	---	0.084
-24.4	---	0.081
-24.4	5310.	0.081

VENTURION 1		H2000R		FBA	
TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
***	***	60.0	9.3		
***	***	140.0	4.0		
***	***	128.0	12.8		
***	***	128.0	377.1		
***	***		441.2		

SCRUBBER PERFORMANCE

98.97	**
-10.22	**
12.2	*
33.6	*
4.6	*
6.	*

SULFATE FORMATION PARAFILERS

CONC.,GM-MOLE/L	0.0425
MOL% TOTAL SULF	6.48
02 AT FURN. EX	4.80
02 AT ABSORB. IN	*****
02 AT ABSORB. EX	*****

	MEANS	ITEM NOT MEASURED
1	0.76	0.89
2	0.76	0.89
3	0.76	0.89
4	0.76	0.89
5	0.76	0.89
6	0.76	0.89
7	0.76	0.89
8	0.76	0.89
9	0.76	0.89
10	0.76	0.89
11	0.76	0.89
12	0.76	0.89
13	0.76	0.89
14	0.76	0.89
15	0.76	0.89
16	0.76	0.89
17	0.76	0.89
18	0.76	0.89
19	0.76	0.89
20	0.76	0.89
21	0.76	0.89
22	0.76	0.89
23	0.76	0.89
24	0.76	0.89
25	0.76	0.89
26	0.76	0.89
27	0.76	0.89
28	0.76	0.89
29	0.76	0.89
30	0.76	0.89
31	0.76	0.89
32	0.76	0.89
33	0.76	0.89
34	0.76	0.89
35	0.76	0.89
36	0.76	0.89
37	0.76	0.89
38	0.76	0.89
39	0.76	0.89
40	0.76	0.89
41	0.76	0.89
42	0.76	0.89
43	0.76	0.89
44	0.76	0.89
45	0.76	0.89
46	0.76	0.89
47	0.76	0.89
48	0.76	0.89
49	0.76	0.89
50	0.76	0.89
51	0.76	0.89
52	0.76	0.89
53	0.76	0.89
54	0.76	0.89
55	0.76	0.89
56	0.76	0.89
57	0.76	0.89
58	0.76	0.89
59	0.76	0.89
60	0.76	0.89
61	0.76	0.89
62	0.76	0.89
63	0.76	0.89
64	0.76	0.89
65	0.76	0.89
66	0.76	0.89
67	0.76	0.89
68	0.76	0.89
69	0.76	0.89
70	0.76	0.89
71	0.76	0.89
72	0.76	0.89
73	0.76	0.89
74	0.76	0.89
75	0.76	0.89
76	0.76	0.89
77	0.76	0.89
78	0.76	0.89
79	0.76	0.89
80	0.76	0.89
81	0.76	0.89
82	0.76	0.89
83	0.76	0.89
84	0.76	0.89
85	0.76	0.89
86	0.76	0.89
87	0.76	0.89
88	0.76	0.89
89	0.76	0.89
90	0.76	0.89
91	0.76	0.89
92	0.76	0.89
93	0.76	0.89
94	0.76	0.89
95	0.76	0.89
96	0.76	0.89
97	0.76	0.89
98	0.76	0.89
99	0.76	0.89
100	0.76	0.89

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-148

DATE 4-28-70

TIME OF DAY 0930

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.435670

HYDROGEN 0.568231

OXYGEN 1.397947

NITROGEN 5.084906

SULFUR 0.008268

FEED RATE, #/SEC = 1.59

ENTHALPY, BTU/# = -776.

FURNACE

INPUT, #/HR 15.16

OUTPUT, #/HR 17.34

PART. SCRUBBER

INPUT, #/HR 17.34

OUTPUT, #/HR 15.94

SO2 ABSORBERS

INPUT, #/HR 15.94

OUTPUT, #/HR 17.35

SO2 ABSORBERS--

PRODUCT COMP.

TOTAL, 4.21

COMBINED 4.21

FREE 0.0

MUND(TOTAL) 4.21

MUND(DISSOLVED) 1.16

MUND(SOLID) 3.05

BISULFITE 0.0

MGO 0.23

SULFATE 0.27

MAGNESIUM 4.71

FLYASH ----

SOLIDS, MG ----

WATER 0.0438

ASH 0.0740

SULFUR 0.0370

OXY+NIT 0.0817

HYDROGEN 0.0485

CARBON 0.7150

*

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 8.90

MGO PRESLAKED, NU=0, YES=1

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.60

SP. GRAVITY, HYDRUM. = 1.0430

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

GRAM/100ML

GM-MOLE/LITER

GM SU2/100ML

0.6571

0.6571

0.0

0.6571

0.1812

0.4758

0.0

0.0367

0.0425

0.7362

0.0

0.147

0.509

1.885

10.087

0.0

11.669

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

OXY+NIT 0.0817

SULFUR 0.0370

ASH 0.0740

WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-149	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-7C	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	1330	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREEN SPEED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.4000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.4500E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2880E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1400E 03	PART.SCRUB.IN	0.4200E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7500E 03	#1 GRIFICE	0.1400E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1200E 03
ABS CRIF.INCH	0.5200E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSCRBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6800E 03	PRI.AIR FAN IN.	0.9300E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.		VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1200E 01
PART.SCR.ST,HG	0.3000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1000E 01
PART.SCR.DP,H2O	0.5100E 01			FBA DP,H2O	0.6400E 01
PART.CYC.DP,H2O	0.6200E 01			FBA DEMIST.DP,H2O	0.1200E 01
#1 ORIF.ST,HG	-0.1600E 01				
#1 ORIF.DP,H2O	0.4300E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1200E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.1559E 05
FBA INLET	0.1340E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.1588E 05
FBA EXIT	0.1250E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1250E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3495E 05
PART.CYC.SUMP	0.1260E 03	FBA SUMP	0.1280E 03	ABS H2O FI.GAL	0.3501E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1280E 03	MGOH2 TANK	0.1300E 03	MGO ROTO.SCALE,%	0.5000E 02
MGO SLAK TANK	0.1800E 03			MAKFUP SETTING	0.5000E 02
MGOH2 TANK	0.1300E 03				
MAKEUP WATER	0.6000E 02				

RUN NUMBER L-149

DATE 4-28-70

TIME OF DAY 1330

FLUE GAS DATA

	FLUE GAS DATA	TEMP. F	SO2 PPM	SO3 PPM	NUX PPM	FLYASH GR/DSCF	HUM. #/F	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	494.	120.0	---	---	---	---	0.015	73.0	487.	16.3
SECONDARY AIR	4815.	737.5	---	---	---	---	0.014	70.4	4751.	7.0
FURNACE EXIT	5713.	420.0	3265.9	18.5	---	---	0.054	114.1	5419.	2.2
PART. SCRB. INLET	5713.	420.0	---	---	---	---	0.054	114.1	---	4.1
PART. CYC. EXIT	5573.	134.0	3261.3	---	---	0.0317	0.092	128.6	5106.	-21.7
VENT ABS. INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC. EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	5573.	134.0	---	---	---	---	0.092	128.6	---	-16.3
FLOATING BED EX	5739.	125.0	---	---	---	---	0.082	124.9	---	-24.4
P.P. EXIT URIF.	5739.	125.0	12.2	---	---	0.0269	0.082	124.9	5303.	-24.4

SCRUBBER STREAM DATA

	TEMP. F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	4.95	MAKEUP WATER	TEMP, F	TEMP, F
MAKEUP WATER	132.0	5.09	MAKEUP NCO SL.	FLOW, #/M	FLOW, #/M
PRODUCT LIQ.	132.0	23.15	PRODUCT LIQ.	---	---
RECIRCULATED LIQ.	---	---	REC. (SPRAY NOZ.)	---	---
---	---	---	REC. (FLOW NOZ.)	---	---

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.536E 07
% FUEL AS COAL	96.3
COAL FLOW RATE, #/HR	424.1
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	19.0
OXYGEN, % DRY, MEAS.	4.00
CO2, % DRY-CALC.	14.60
HUMIDITY, #/F - CALC.	0.054

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	0.14
FLYASH COL. EFF	---
SO3 ABSORB. EFF	---
NUX ABSORB. EFF	---
GAS VELOCITY, FPS	154.6
LIQ/GAS, GAL/MCF	15.1
LIQ/GAS, #/F	2.1
PRES. DROP, IN. WG	5.1

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, # MOLE/HR-FT2,	---
SULFITE/SO2-MOL/MOL	---
SUMP RESID. TIME, MIN	---

FLOATING BED ABSORBER

KGA, # MOLE/HR-FT2	61.5
SULFITE/SO2-MOL/MOL	8.66
SUMP RESID. TIME, MIN	14.7

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0268
MOL % TOTAL SULF=	4.68
O2 AT FURN. EX=	4.00
O2 AT ABSORB. IN=	---
O2 AT ABSORB. EX=	---

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-149 DATE 4-28-70 TIME OF DAY 1330

MATERIAL BALANCES

INPUT FOR EO. - KIN. PRCG.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR 15.69
18.51
MAGNESIUM
FLYASH 31.38
WATER 275.3
294.5
DRY GAS 5411.
5419.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

18.51
17.41
2772.
3016.
5419.
5106.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

17.41
20.92
0.27
0.27
1258.
1451.
5106.
5303.

*

SO2 ABSORBERS-
PRODUCT COMP.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGD/100ML =
MGO PRESLAKED, NG=0, YES=1
% SLAKED TO MG(OH)2, MEAS. =

1

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML 3.67
3.67
0.0
3.67
1.10
2.57
0.0
0.04
0.17
3.88

GRAM/
100ML

1.787
8.514
0.0
0.026
0.321

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =
SP. GRAVITY, HYDROM. =

7.50
1.0530

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =
FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-150	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-70	WINDBOX ST, H2O	0.5000E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1500	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1800E 01	O2 FURN. EX. % - BM	0.4000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.4500E 01	CCMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2880E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LCAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1500E 03	PART. SCRUB. IN	0.4400E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.1500E 03
ABS LCAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1500E 03
ABS ORIF. INCH	0.5200E 01	WINDBOX-BUT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANUMETER CODE	0	NO. 1 BANK OUT	0.7000E 03	PRI. AIR FAN IN.	0.9800E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.6000E 03	PRI. AIR WGT BULB	0.7600E 02
MODE OF OPER.	3	FURN. EXIT	0.4200E 03	SEC. AIR FAN IN.	0.8000E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR	0.1500E 03	SEC. AIR WGT BULB	0.7000E 02
PART. SCR. DP, H2O	0.5200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5000E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1200E 01
#1 ORIF. ST, HG	-0.1000E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 ORIF. DP, H2O	0.4000E 01			FBA DP, H2O	0.6500E 01
				FBA DEMIST. DP, H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 CRIFICE	0.1340E 03	PART. CYC. EXIT	0.1340E 03	PART. INIT. GAL	0.1588E 05
FBA INLET	0.1340E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.1618E 05
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.1340E 03	PART. TIME, MIN	0.6000E 02
P. P. EXIT	0.1280E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.3501E 05
PART. CYC. SUMP	0.1260E 03	FBA SUMP	0.1340E 03	ABS H2O FI. GAL	0.3506E 05
ABS CYC. SUMP	0.8600E 02	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1340E 03	MGOH2 TANK	0.1450E 03	MGO ROTU. SCALE, %	0.5500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5500E 02
MGOH2 TANK	0.1440E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	L-150	DATE	4-28-70	TIME OF DAY	1500	INPUT FOR EQ. - KIN. PROG.				
MATERIAL BALANCES						SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE						INPUT, #/HR	15.45	30.89	278.5	5327.
						OUTPUT, #/HR	19.53	*****	297.5	5335.
PART. SCRUBBER						INPUT, #/HR	19.53	*****	2775.	5335.
						OUTPUT, #/HR	17.72	*****	3029.	4945.
SO2 ABSORBERS						INPUT, #/HR	17.72	*****	1293.	4945.
						OUTPUT, #/HR	17.77	*****	1200.	5211.
* SO2 ABSORBERS-PRODUCT COMP.						GM SO2/100ML	GM-MOLE/LITER	GRAM/100ML	MAKEUP MGO COMPOSITION	
						TOTAL,	4.39	---	SLURRY CONC.- GM MGO/100ML =	*****
						COMBINED	4.39	---	MGO PRESLAKED, NO=0, YES=1	1
						FREE	0.0	---	% SLAKED TO MG(OH)2, MEAS. =	*****
						MONO(TOTAL)	4.39	---	PRODUCT MG BASE PHYSICAL PROPERTIES	
						MONO(DISSOLVED)	0.90	---	ACID STRENGTH, PH =	7.00
						MONO(SOLID)	3.49	1.462	SP. GRAVITY, HYDRUM. =	1.0600
						BISULFITE	0.08	11.571		
						MGO	0.09	0.116		
						SULFATE	0.20	0.053		
						MAGNESIUM	4.68	0.377		
						FLYASH	---	---	PARTICULATE SCRUBBER PRODUCT	
						SOLIDS, MG	---	---	ACID STRENGTH, PH =	2.20
								*****	FLYASH CONC. GM/100ML =	0.89

COAL COMPOSITION-MASS										
						CARBON	0.7150			
						HYDROGEN	0.0485			
						OXY+NIT	0.0817			
						SULFUR	0.0370			
						ASH	0.0740			
						WATER	0.0438			

FEED RATE, #/SEC= 1.55

ENTHALPY, BTU/# = -1968.

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-151	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-7C	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	1630	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	C.4100E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.4000E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.4600E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVULT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2880E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.5000E 02	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.6000E 02	PART.SCRUB.IN	0.4400E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7400E 03	#1 ORIFICE	0.1500E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1500E 03
ABS ORIF.INCH	0.5400E 01	WINDBOX-BOT.	0.7500E 03	AIR HEATER #1	0.5000E 02
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7000E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI.AIR FAN IN.	0.9900E 02
CARD NUMBER	7	NO.2 BANK OUT	0.4200E 03	PRI.AIR WGT BUIB	0.7800E 02
MODE OF OPER.	3	FURN. EXIT	0.1500E 03	SEC.AIR FAN IN.	0.8000E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR		SEC.AIR WET BULB	0.6800E 02
PART.SCR.DP,H2O	0.6000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5800E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	0.1200E 01
#1 ORIF.ST,HG	0.1000E 01	ABS CYC.DP,H2O	C.0	FBA SUMP DP,H2O	C.1000E 01
#1 ORIF.DP,H2O	0.4000E 01			FBA DP,H2O	C.6600E 01
				FBA DEMIST.DP,H2O	0.1200E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1120E 03	TEMP.THERMOMETERS,F	0.1350E 03	MAKEUP FLOWS	
#1 ORIFICE	0.1340E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.1618E 05
FBA INLET	0.2800E 02	ABS CYC.EXIT	0.1350E 03	PART.FINAL,GAL	0.1648E 05
FBA EXIT	0.1280E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.1340E 03	ABS H2O IN.GAL	C.3506E 05
PART.CYC.SUMP	0.8600E C2	FBA SUMP	0.0	ABS H2O FI.GAL	0.3512E 05
ABS CYC.SUMP	0.1390E 03	MGO SLAK TANK	0.1400E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.0	MGOH2 TANK		MGO RUTO.SCALE,%	C.4800E 02
MGO SLAK TANK	0.1380E 03			MAKEUP SETTING	0.4800E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-151

DATE 4-28-70

TIME OF DAY 1630

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SU2 PPM	SU3 PPM	NUX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	472.	150.0	----	----	----	----	0.017	77.2	464.	16.3
SECONDARY AIR	5231.	572.5	----	----	----	----	0.014	70.5	5161.	7.0
FURNACE EXIT	6137.	420.0	3499.4	----	----	----	0.054	114.1	5821.	2.2
PART.SCRB.INLET	6137.	440.0	*****	*****	*****	*****	0.054	114.1	-----	2.7
PART.CYC.EXIT	5613.	135.0	3426.9	*****	*****	*****	0.097	133.8	5118.	13.5
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN	5613.	134.0	*****	*****	*****	*****	0.097	133.8	-----	16.3
FLOATING BED EX	5738.	28.0	*****	*****	*****	*****	0.114	135.3	-----	-24.4
P.P. EXIT DRIF.	5738.	128.0	24.9	*****	*****	*****	0.114	135.3	5152.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	TEMP,F	FLOW,#/M	FBA
PARTICULATE	60.0	4.97	MAKEUP WATER	*****	*****	60.0
MAKEUP WATER	135.0	5.09	MAKEUP MGD SL.	*****	6.4	138.0
PRODUCT LIQ.	135.0	23.15	PRODUCT LIQ.	*****	*****	134.0
RECIRCULATED LIQ.			REC.(SPRAY NO2)	*****	*****	134.0
			REC.(FLOW NO2.)	*****	*****	394.7
						483.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR 0.576E 07
% FUEL AS COAL 96.6
COAL FLOW RATE,#/HR. 456.6
NAT.GAS FLOW,#/HR 8.9
% EXCESS AIR 19.0
OXYGEN,% DRY, MEAS. 4.00
CO2,% DRY-CALC. 14.61
HUMIDITY,#/# - CALC. 0.054

SCRUBBER PERFORMANCE

SU2 ABSORB.EFF 0.576E 07
FLYASH COL.EFF 96.6
SU3 ABSORB.EFF 456.6
NOX ABSORB.EFF 8.9
GAS VELOCITY,FPS 142.8
LIQ/GAS,GAL/MCF 16.3
LIQ/GAS,#/# 2.1
PRES.DROP,IN.WG 6.0

VENT ABS.

FLOAT.BED 99.27

SU2 ABSORPTION PARAMETERS

VENTURI ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FIT2, = ***** KGA,#MOLE/HR-FIT2 = 52.7
SULFITE/SU2-MOL/MOL = ***** SULFITE/SO2-MOL/MOL = 8.96
SUMP RESID.TIME,MIN = ***** SUMP RESID.TIME,MIN = 22.7

CONC.,GM-MOLE/L= 0.0245
MOL% TOTAL SULF= 3.70
O2 AT FURN.EX.= 4.00
O2 AT ABSORB.IN= *****
O2 AT ABSORB.EX= *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-151

DATE 4-28-70

TIME OF DAY 1630

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	16.89	-----	33.79	297.2	5812.
OUTPUT, #/HR	21.30	-----	*****	316.4	5821.
PART. SCRUBBER					
INPUT, #/HR	21.30	-----	*****	2802.	5821.
OUTPUT, #/HR	18.34	-----	*****	3044.	5118.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

18.34 1246.
17.28 1296.

ENTHALPY, BTU/# = -5410.

*SO2 ABSORBERS-
PRODUCT COMP.

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = 9.50
MGD PRESKALD, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,	GRAM/	GM-MOLE/	GM SO2/
COMBINED	100ML	LITER	100ML
FREE	-----	0.6737	4.31
MUNO(TOTAL)	-----	0.6605	4.23
MUNO(DISSOLVED)	-----	0.0132	0.08
MUNO(SOLID)	-----	0.6473	4.14
BISULFITE	1.852	0.1781	1.14
MGU	9.946	0.4691	3.00
SULFATE	0.291	0.0156	0.20
MAGNESIUM	0.0	0.0	0.0
FLYASH	0.293	0.0245	0.16
SOLIDS, MG	-----	0.6849	4.38
	*****	-----	-----
	*****	-----	-----

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.80
SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-152	CARD NUMBER	3
DATE	4-28-7C	N.G. FLOW, %SCALE	0.9900E 02
TIME	1800	N.G. STATIC, R.O.	0.8500E 01
PRI-AIR ST, HG	0.1300E 01	SCREW SPEED, RPM	0.4100E 03
PRI-AIR DP, H2O	0.2500E 01	02 FURN-EX, %BM	0.4500E 01
SEC-AIR ST, HG	0.1400E 01	COMB-FURN, EX, %	0.0
SEC-AIR DP, H2O	0.2600E 01	ELE-CHEM, MILVOLT	0.0
		CFL TEMP, F	0.0
		BAROMETRIC, HG	0.2880E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ., PSIG	0.4000E 02	TEMP.FURN.RECORDER, F		TEMP.CONTINUED	
PART.LOAD, PSIG	0.4200E 02	SEC.AIR GRIF.	0.5000E 02	PART.SCRUB-IN	0.4400E 03
ABS NCZ., PSIG	0.2700E 02	WINDBOX-TOP	0.6000E 02	#1 CRIFICE	0.1500E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1500E 03
ABS ORIF. INCH	0.5300E 01	WINDBOX-HOT	0.7400E 03	AIR HEATER #1	0.5000E 02
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7000E 03	PRI-AIR FAN IN.	0.9900E 02
		NO.2 BANK OUT	0.6000E 03	PRI-AIR WGT BULB	0.7800E 02
CARD NUMBER	7	FURN. EXIT	0.4200E 03	SEC.AIR FAN IN.	0.8000E 02
MODE OF OPER.	3	COAL-AIR	0.1500E 03	SEC.AIR WET BULB	0.6800E 02
PART.SCR.ST, HG	0.2000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP, H2O	0.6200E 01	VENT.ABS.DP, H2O	0.0	FBA INLET ST, HG	0.1200E 01
PART.CYC.DP, H2O	0.6000E 01	ABS CYC.DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 ORIF.ST, HG	-0.1000E 01			FBA DP, H2O	0.6400E 01
#1 URIF.DP, H2O	0.4000E 01			FBA DEMIST.DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER, F		TEMP.THERMOMETERS, F		MAKEUP FLOWS	
#1 CRIFICE	0.1120E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.1648E 05
FBA INLET	0.1340E 03	ABS CYC.EXIT	0.0	PART.FINAL, GAL	0.1680E 05
FBA EXIT	0.2800E 02	PART.CYC.SUMP	0.1340E 03	PART.TIME, MIN	0.5000E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.0	ABS H2O IN, GAL	0.3512E 05
PART.CYC.SUMP	0.1280E 03	FBA SUMP	0.1340E 03	ABS H2O F.I. GAL	0.3516E 05
ABS CYC.SUMP	0.8600E 02	MCO SLAK TANK	0.0	ABS H2O TIME, MIN	0.5000E 02
FBA SUMP	0.1390E 03	MCOH2 TANK	0.1420E 03	MGO ROTO.SCALE, %	0.5100E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5100E 02
MGOH2 TANK	0.1380E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-152

DATE 4-28-70

TIME OF DAY 1800

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	492.	150.0	-----	-----	-----	-----	0.017	77.2	484.	17.6
SECONDARY AIR	5436.	572.5	-----	-----	-----	-----	0.014	70.4	5363.	6.0
FURNACE EXIT	6367.	420.0	3386.3	-----	-----	-----	0.053	113.4	6045.	2.6
PART. SCRUB. INLET	6367.	440.0	-----	-----	-----	-----	0.053	113.4	-----	2.7
PART. CYC. EXIT	5412.	134.0	3242.7	-----	-----	-----	0.104	133.4	4903.	-13.5
VENT ABS. INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN	5412.	134.0	*****	*****	*****	*****	0.104	133.4	-----	16.3
FLOATING BED EX	5846.	28.0	*****	*****	*****	*****	0.121	137.2	-----	-24.4
P.P. EXIT ORIF.	5846.	128.0	33.7	*****	*****	*****	0.121	137.2	5216.	-24.4

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP, F	FLOW, #/M	FBA	TEMP, F	FLOW, #/M
PARTICULATE	60.0	6.44	MAKEUP WATER	*****	*****	*****	60.0	6.6	6.6
MAKEUP WATER	134.0	5.09	MAKEUP MGD SL.	*****	*****	*****	138.0	5.6	5.6
PRODUCT LIQ.	134.0	23.15	PRODUCT LIQ.	*****	*****	*****	134.0	12.8	12.8
RECIRCULATED LIQ.			REC. (SPRAY NOZ)	*****	*****	*****	134.0	394.7	478.9
			REC. (FLOW NOZ.)	*****	*****	*****			

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.581E 07
% FUEL AS COAL	96.6
COAL FLOW RATE, #/HR	461.1
NAT. GAS FLOW, #/HR	9.0
% EXCESS AIR	21.4
OXYGEN, % DRY, MEAS.	4.50
CO2, % DRY-CALC.	14.18
HUMIDITY, #/# - CALC.	0.053

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	4.24
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	148.1
LIQ/GAS, GAL/MCF	15.8
LIQ/GAS, #/#	2.1
PRES. DROP, IN. WG	6.2

VENT ABS.

VENT ABS.	*****
*****	98.96
*****	*****
*****	*****
*****	*****
*****	10.6
*****	42.4
*****	4.9
*****	6.4

FLOAT. BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID. TIME, MIN	=	*****

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	49.5
SULFITE/SC2-MOL/MOL	=	8.60
SUMP RESID. TIME, MIN	=	22.7

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0346
MOL% TOTAL SULF=	5.52
O2 AT FURN. EX.=	4.50
O2 AT ABSORB. IN=	*****
O2 AT ABSORB. EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER	L-152	DATE	4-28-70	TIME OF DAY	1800	INPUT FOR EQ. - KIN. PROG.				
MATERIAL BALANCES						SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE						17.06	-----	34.12	302.4	6036.
INPUT, #/HR						21.44	-----	*****	321.6	6045.
OUTPUT, #/HR										
PART. SCRUBBER						21.44	-----	*****	3544.	6045.
INPUT, #/HR						16.66	-----	*****	3058.	4503.
OUTPUT, #/HR										
SO2 ABSORBERS						16.66	*****	*****	1243.	4903.
INPUT, #/HR						16.35	12.21	*****	1342.	5216.
OUTPUT, #/HR										
*SO2 ABSORBERS-PRODUCT COMP.										
TOTAL,						3.99	0.6237	-----		
COMBINED						3.99	0.6237	-----		
FREE						0.0	0.0	-----		
MONO(TOTAL)						3.99	0.6237	-----		
MONO(DISSOLVED)						1.06	0.1656	1.722		
MONO(SOLID)						2.93	0.4580	5.710		
BISULFITE						0.16	0.0125	0.233		
MGO						0.02	0.0033	0.013		
SULFATE						0.22	0.0346	0.415		
MAGNESIUM						4.23	0.6615	-----		
FLYASH						-----	-----	*****		
SOLIDS, MG						-----	-----	8.694		
MAKEUP MGD COMPOSITION										
SLURRY CONC. - GM MGD/100ML =										*****
MGJ PRESLAKED, NO=0, YES=1										1
% SLAKED TO MG(OH)2, MEAS. =										*****
PRODUCT MG BASE PHYSICAL PROPERTIES										
ACID STRENGTH, PH =										6.80
SP. GRAVITY, HYDROM. =										1.0500
PARTICULATE SCRUBBER PRODUCT										
ACID STRENGTH, PH =										*****
FLYASH CONC. GM/100ML =										*****
FEED RATE, #/SEC =										1.75
ENTHALPY, BTU/# =										-5119.

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.443605
HYDROGEN 0.599025
OXYGEN 1.397127
NITROGEN 5.077572
SULFUR 0.008440

FEED RATE, #/SEC = 1.75

ENTHALPY, BTU/# = -5119.

MAKEUP MGU COMPOSITION
SLURRY CONC. - GM MGU/100ML = *****
MGJ PRESLAKED, NO=0, YES=1 I
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.80
SP.GRAVITY, HYDROM. = 1.0500

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-153	CARD NUMBER	2	CARD NUMBER	3
DATE	4-28-70	WINDBOX ST, H2O	0.5800E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	2230	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.6000E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1000E 01	SCREW SPCD, RPM	0.4500E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1600E 01	O2 FURN. EX. % - BM	0.4000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.3500E 01	CONB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2884E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR DRIF.	0.1250E 03	PART. SCRUB. IN	0.4400E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX - TOP	0.7600E 03	#1 DRIFICE	0.1450E 03
ABS LOAD, PSIG	0.4800E 02	WINDBOX - WEST	0.7300E 03	FBA INLET	0.1000E 03
ABS DRIF. INCH	0.5300E 01	WINDBOX - BGT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX - EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6800E 03	PRI. AIR FAN IN.	0.9200E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.5900E 03	PRI. AIR WGT BULB	0.7300E 02
MODE CF OPER.	3	FURN. EXIT	0.4100E 03	SEC. AIR FAN IN.	0.7200E 02
PART. SCR. ST, HG	0.1000E 00	COAL - AIR	0.1200E 03	SEC. AIR WET BULB	0.6500E 02
PART. SCR. DP, H2O	0.5000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5800E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1200E 01
#1 DRIF. ST, HG	-0.9000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.9000E 00
#1 DRIF. DP, H2O	0.3900E 01			FBA DP, H2O	0.6400E 01
				FBA DEMIST. DP, H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 DRIFICE	0.1080E 03	PART. CYC. EXIT	0.1340E 03	PART. INIT. GAL	0.1822E 05
FBA INLET	0.1340E 03	ABS CYC. EXIT	0.0	PART. FINAL. GAL	0.1855E 05
FBA EXIT	0.1250E 03	PART. CYC. SUMP	0.1310E 03	PART. TIME, MIN	0.6000E 02
P.P. EXIT	0.1250E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.3550E 05
PART. CYC. SUMP	0.1250E 03	FRA SUMP	0.1320E 03	ABS H2O FI. GAL	0.3556E 05
ABS CYC. SUMP	0.8100E 02	MGO SLAK TANK	0.1980E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1320E 03	MGOH2 TANK	0.1260E 03	MGO ROTO. SCALE, %	0.5600E 02
MGO SLAK TANK	0.2030E 03			MAKEUP SETTING	0.5600E 02
MGOH2 TANK	0.1230E 03				
MAKEUP WATER	0.6000E 02				

C

DATE 4-28-70

TIME OF DAY 2230

INPUT FOR EQ. - KIN

FURNACE

INPUT, #/HR
OUTPUT, #/HR

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SD2 ABSCBERS
INPUT, #/HR
OUTPUT, #/HR

★ SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGD
SULFATE
MAGNESIUM
FLYASH
SOLIDS,MG

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-154	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.6100E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	0001	BURNER DP,H2C	0.6000E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1200E C1	FURN. ST,H2O	0.1000E 01	SCREW SPEED,RPM	0.4500E 03
PRI.AIR DP,H2O	0.2200E C1	PP EXIT ST,HG	-0.1700E 01	O2 FURN.EX.%-BM	0.4200E 01
SEC.AIR ST,HG	0.1500E C1	PP EXIT DP,H2O	0.3500E 01	CCMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2400E C1	FURN.EX.ST,H2O	0.1000E 01	ELE.CHEM.MILVOLT	0.0
		PCEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2884E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NDZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1250E 03	TEMP.CONTINUED	0.4300E 03
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.7650E 03	PART.SCRUB.IN	0.1450E 03
ABS NDZ.,PSIG	0.2600E 02	WINDBOX-ICP	0.7350E 03	#1 ORIFICE	0.1000E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7350E 03	FBA INLET	0.8500E 03
ABS ORIF.INCH	0.4800E 01	WINDBOX-BCT.	0.7550E 03	AIR HEATER #1	0.8500E 03
ABSORBER NDZ. CODE	1	WINDBOX-EAST	0.7000E 03	AIR HEATER #2	0.7200E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.6100E 03	PRI.AIR FAN IN.	0.7000E 02
		NO.2 BANK OUT	0.4150E 03	SEC.AIR FAN IN.	0.6500E 02
CARD NUMBER	7	FURN. EXIT	0.1200E 03		
MODE OF OPER.	3	COAL-AIR			
PART.SCR.ST,HG	0.1000E 00				
PART.SCR.DP,H2O	0.5000E 01				
PART.CYC.UP,H2O	0.5800E 01				
#1 URIF.ST,HG	-0.9000E C0				
#1 ORIF.UP,H2O	0.3800E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.9000E 00
		FBA DP,H2O	0.6400E 01
		FBA DEMIST.DP,H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1070E 03	TEMP.THERMOMETERS,F	0.1350E 03	MAKEUP FLOWS	0.1872E 05
#1 ORIFICE	0.1350E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.1905E 05
FBA INLET	0.1260E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.6000E 02
FBA EXIT	0.1260E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.3558E 05
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.1320E 03	ABS H2O IN.GAL	0.3564E 05
PART.CYC.SUMP	0.8200E C2	FBA SUMP	0.2100E 05	ABS H2O FI.GAL	0.6000E 02
ABS CYC.SUMP	0.1320E 03	MGO SLAK TANK	0.1220E 03	ABS H2O TIME,MIN	0.5300E 02
FBA SUMP	0.2070E C3	MGOH2 TANK		MGO ROTU.SCALE,%	0.5300E 02
MGO SLAK TANK	0.1170E 03			MAKEUP SETTING	0.5300E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-154

DATE 4-29-70

TIME OF DAY 0001

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	474.	120.0	---	---	---	---	0.014	71.4	467.	16.3
SECONDARY AIR	488.	747.5	---	---	---	---	0.013	70.2	4823.	6.1
FURNACE EXIT	5765.	415.0	3423.2	---	---	---	0.054	113.6	5471.	1.0
PART. SCRB. INLET	5765.	430.0	---	---	---	---	0.054	113.6	---	1.4
PART. CYC. EXIT	5297.	135.0	3348.8	---	---	---	0.095	131.1	4834.	-12.2
VENT ABS. INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5297.	135.0	*****	*****	*****	*****	0.096	131.1	---	-14.9
FLOATING BED EX	5056.	126.0	*****	*****	*****	*****	0.091	128.3	---	-23.0
P.P. EXIT URIF.	5056.	126.0	27.2	*****	*****	*****	0.091	128.3	4634.	-23.0

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE					
MAKEUP WATER	60.0	5.43	MAKEUP WATER	TEMP, F FLOW, #/M	TEMP, F FLOW, #/M
PRODUCT LIQ.	131.0	5.09	MAKEUP MGO SL.	*****	60.0 7.6
RECIRCULATED LIQ.	131.0	23.15	PRODUCT LIQ.	*****	117.0 5.8
			REC. (SPRAY NOZ)	*****	132.0 13.6
			REC. (FLOW NOZ.)	*****	132.0 386.0
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.535E 07
% FUEL AS COAL	96.3
COAL FLOW RATE, #/HR	423.6
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	20.0
OXYGEN, % DRY, MEAS.	4.20
CO2, % DRY-CALC.	14.43
HUMIDITY, #/# - CALC.	0.054

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	2.17
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	143.7
LIQ/GAS, GAL/MCF	16.2
LIQ/GAS, #/#	2.2
PRES. DROP, IN. WG	5.0

VENT ABS.

FLOAT. BED	99.19

	10.7
	39.7
	5.4
	6.4

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2,	=	*****	KGA, #MOLE/HR-FT2	=	46.3
SULFITE/SC2-MOL/MOL	=	*****	SULFITE/SC2-MOL/MOL	=	8.09
SUMP RESID. TIME, MIN	=	*****	SUMP RESID. TIME, MIN	=	16.9
***** MEANS ITEM NOT MEASURED					

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0355
MOL% TOTAL SULF=	5.55
O2 AT FURN. EX.=	4.20
O2 AT ABSORB. IN=	*****
O2 AT ABSORB. EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-154

DATE 4-29-70

TIME OF DAY 0001

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.	
INPUT, #/HR	15.67			31.34	274.6	5463.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	19.60			*****	293.7	5471.	CARBON	0.450513
							HYDROGEN	0.576413
							OXYGEN	1.396223
							NITROGEN	5.071238
							SULFUR	0.008558

S02 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

16.94	17.81	1233.	4834.
17.80	13.40	1173.	4634.

*

#SC2 ABSORBERS-
PRODUCT COMP.

GM S02/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGD COMPOSITION

SLURRY CONC.- GM MGD/100ML = 8.60
MGD PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGU
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.50
SP.GRAVITY, HYDROM. = 1.0410

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-155	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	0300	BURNER DP, H2O	0.6200E 01	N.G. STATIC, R.O.	0.7900E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1000E 01	SCREEN SPEED, RPM	0.4500E 04
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1700E 01	02 FURN. EX. % - BM	0.4000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.3400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEM. MILVCLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2885E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR GRIF.	0.1200E 03	PART. SCRUB. IN	0.4300E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX-TOP	0.7600E 03	#1 GRIFICE	0.1450E 03
ABS LOAD, PSIG	0.4800E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1000E 03
ABS GRIF. INCH	0.4800E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6700E 03	PRI. AIR FAN IN.	0.8800E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.5900E 03	PRI. AIR WGT BULB	0.7250E 02
MODE CF OPER.	3	FURN. EXIT	0.4150E 03	SEC. AIR FAN IN.	0.6800E 02
PART. SCR. ST, HG	0.1000E 00	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.6400E 02
PART. SCR. DP, H2O	0.5200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5700E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1100E 01
#1 GRIF. ST, HG	-0.9000E 00	ABS CYC. DP, H2O	0.0	FBA SUNP DP, H2O	0.8000E 00
#1 GRIF. DP, H2O	0.4000E 01	CARD NUMBER	11	FBA DP, H2O	0.6400E 01
		TEMP. THERMOMETERS, F		FBA DEMIST. DP, H2O	0.1000E 01
CARD NUMBER	10	PART. CYC. EXIT	0.1340E 03	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1020E 03	ABS CYC. EXIT	0.0	MAKEUP FLOWS	
#1 GRIFICE	0.1340E 03	PART. CYC. SUMP	0.1310E 03	PART. INIT. GAL	0.1967E 05
FBA INLET	0.1270E 03	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.1998E 05
FBA EXIT	0.1270E 03	FBA SUMP	0.1320E 03	PART. TIME, MIN	0.6000E 02
P.P. EXIT	0.1250E 03	MGO SLAK TANK	0.1070E 03	ABS H2O IN. GAL	0.3576E 05
PART. CYC. SUMP	0.8100E 02	MGOH2 TANK	0.1470E 03	ABS H2O FI. GAL	0.3580E 05
ABS CYC. SUMP	0.1320E 03			ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1090E 03			MGO ROTO. SCALE, %	0.5900E 02
MGO SLAK TANK	0.1420E 03			MAKEUP SETTING	0.5900E 02
MGOH2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA P 1

RUN NUMBER L-155

DATE 4-29-70

TIME OF DAY 0300

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NUX PPM	FLYASH GR/DSCF	HUM. #/#	DEW PCINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	474.	120.0	---	---	---	---	0.015	72.6	467.	16.3
SECONDARY AIR	4902.	742.5	---	---	---	---	0.013	69.5	4839.	6.0
FURNACE EXIT	5785.	415.0	3264.5	---	---	---	0.054	113.8	5489.	1.0
PART.SCRB.INLET	5785.	430.0	---	---	---	---	0.054	113.8	---	1.4
PART.CYC.EXIT	5440.	134.0	3212.2	---	---	---	0.097	131.5	4959.	-12.2
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5440.	134.0	*****	*****	*****	*****	0.097	131.5	---	-14.9
FLOATING BED EX	4977.	127.0	*****	*****	*****	*****	0.094	129.5	---	-23.0
P.P. EXIT GRIF.	4977.	127.0	16.5	*****	*****	*****	0.094	129.5	4548.	-23.0

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.19	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	131.0	4.92	MAKEUP MGO SL.	*****	60.0 6.4
PRODUCT LIQ.	131.0	23.15	PRODUCT LIQ.	*****	142.0 6.2
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	132.0 13.6
			REC.(FLOW NOZ.)	*****	132.0 386.0
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.543E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	429.9
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	19.0
OXYGEN,% DRY, MEAS.	4.00
CO2,% DRY-CALC.	14.61
HUMIDITY,#/# - CALC.	0.054

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.60
FLYASH CUL.EFF	*****
SO3 ABSORB.EFF	*****
NUX ABSORB.EFF	*****
GAS VELOCITY,FPS	147.3
LIQ/GAS,GAL/MCF	15.8
LIQ/GAS,#/#	2.1
PRES.DROP,IN.WG	5.2

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	49.8
SULFITE/SO2-MOL/MOL	=	8.42
SUMP RESID.TIME,MIN	=	13.2

VENT ABS.

*****	99.49
*****	*****
*****	*****
*****	*****
*****	*****
*****	10.6
*****	40.2
*****	5.5
*****	6.4

FLOAT.BED

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	*****
MOL% TOTAL SULF=	*****
O2 AT FURN.EX.=	4.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-155

DATE 4-29-70

TIME OF DAY 0300

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON	0.455449
HYDROGEN	0.586702
OXYGEN	1.395652
NITROGEN	5.066691
SULFUR	0.008655

FEED RATE, #/SEC = 1.60

ENTHALPY, BTU/# = -1208.

*

*SO2 ABSORBERS- PRODUCT COMP.

SO2 ABSORBERS

INPUT, #/HR	16.66
OUTPUT, #/HR	15.71

1202.
1190.

4959.
4548.

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = 9.10

MGD PRESLAKED, NU=0, YES=1

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.60

SP. GRAVITY, HYDROM. = 1.0380

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-156	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-76	WINDBOX ST,H2O	0.6000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	0430	BURNER DP,H2O	0.6100E 01	N.G. STATIC,R.O.	0.8000E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.1000E 01	SCREW SPEED,RPM	0.4500E 09
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX.%-BM	0.4300E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.3500E 01	COB.FURN,FX.%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX.ST,H2O	0.1000E 01	ELE.CHEM.MILVELT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2886E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1200E 03	PART.SCRUB.IN	0.4500E 03
ABS NOZ.,PSIG	0.2600E 02	WINDBOX-TOP	0.7550E 03	#1 ORIFICE	0.1450E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7250E 03	FBA INLET	0.1000E 03
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.7250E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
NANOMETER CODE	0	NO.1 BANK OUT	0.6950E 03	PRI.AIR FAN IN.	0.9000E 02
		NO.2 BANK OUT	0.6100E 03	PRI.AIR WGT BULB	0.7400E 02
		FURN. EXIT	0.4200E 03	SEC.AIR FAN IN.	0.6800E 02
		COAL-AIR	0.1200E 03	SFC.AIR WET BULB	0.6400E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.	3	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1100E 01
PART.SCR.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.9000E 00
PART.SCR.DP,H2O	0.4900E 01			FBA DP,H2O	0.6300E 01
PART.CYC.DP,H2O	0.5800E 01			FBA DELMIST.DP,H2O	0.1000E 01
#1 ORIF.ST,HG	-0.9000E 00				
#1 ORIF.DP,H2O	0.3900E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1050E 03	PART.CYC.EXIT	0.1340E 03	PART.INIT.GAL	0.2015E 05
FBA INLET	0.1340E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2047E 05
FBA EXIT	0.1270E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3584E 05
PART.CYC.SUMP	0.1270E 03	FBA SUMP	0.1320E 03	ABS H2O F1.GAL	0.3589E 05
ABS CYC.SUMP	0.1000E 03	MGD SLAK TANK	0.2070E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1320E 03	MGD2 TANK	0.1370E 03	MGD ROTD.SCALE,%	0.5500E 02
MGD SLAK TANK	0.2080E 03			MAKEUP SETTING	0.5500E 02
MGD2 TANK	0.1320E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-156

DATE 4-29-70

TIME OF DAY 0430

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SC2 PPM	SC3 PPM	NOX PPM	FLYASH GR/USCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	474.	120.0	---	---	---	---	0.015	74.2	467.	17.6
SECONDARY AIR	4903.	736.3	---	---	---	---	0.013	69.5	4839.	6.0
FURNACE EXIT	5779.	420.0	3187.6	---	---	---	0.053	113.4	5487.	1.0
PART.SCRB.INLET	5779.	450.0	---	---	---	---	0.053	113.4	---	1.4
PART.CYC.EXIT	5364.	134.0	3132.5	---	---	---	0.101	132.8	4872.	-12.2
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5364.	134.0	*****	*****	*****	*****	0.101	132.8	---	-14.9
FLOATING BED EX	5034.	127.0	*****	*****	*****	*****	0.097	130.4	---	-24.4
P.P. EXIT CRIF.	5034.	127.0	18.0	*****	*****	*****	0.097	130.4	4588.	-24.4

SCRUBBER STREAM DATA

	TEMP,F	FLOW,CPM	GAS ABSORBER	VENTURI ABSORBER	FHA
PARTICULATE				TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	60.0	5.30	MAKEUP WATER	*****	60.0
PRODUCT LIQ.	132.0	4.92	MAKEUP MGD SL.	*****	132.0
RECIRCULATED LIQ.	132.0	23.15	PRODUCT LIQ.	*****	132.0
			REC.(SPRAY NOZ)	*****	132.0
			REC.(FLOW NOZ.)	*****	386.0
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.534E 07
% FUEL AS COAL	96.3
COAL FLOW RATE,#/HR	422.4
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	20.5
OXYGEN,% DRY, MEAS.	4.30
CO2,% DRY-CALC.	14.35
HUMIDITY,#/# - CALC.	0.053

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.73
FLYASH COL.EFF	*****
SU3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	145.7
LIQ/GAS,GAL/MCF	16.0
LIQ/GAS,#/#	2.2
PRES.DROP,IN.WG	4.9

VENT ABS.

VENT ABS.	*****
*****	99.43
*****	*****
*****	*****
*****	*****
*****	10.8
*****	39.5
*****	5.4
*****	6.3

FLOAT.BED

FLOAT.BED	99.43
*****	*****
*****	*****
*****	*****
*****	*****
*****	10.8
*****	39.5
*****	5.4
*****	6.3

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	*****
SULFITE/SC2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****
*****	MEANS	ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	49.2
SULFITE/SC2-MOL/MOL	=	8.91
SUMP RESID.TIME,MIN	=	13.2

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0434
MUL% TOTAL SULF=	5.83
O2 AT FURN.EX.=	4.30
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-156 DATE 4-29-70 TIME OF DAY 0430

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

MATERIAL BALANCES	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
FURNACE					
INPUT, #/HR	15.63	---	31.25	273.5	5479.
OUTPUT, #/HR	18.31	---	*****	292.5	5487.
PART. SCRUBBER					
INPUT, #/HR	18.31	---	*****	2946.	5487.
OUTPUT, #/HR	15.98	---	*****	2955.	4872.
SO2 ABSORBERS					
INPUT, #/HR	15.98	19.75	*****	1222.	4872.
OUTPUT, #/HR	20.87	16.01	*****	1189.	4588.

FEED RATE, #/SEC = 1.59

ENTHALPY, BTU/# = -1213.

* *SO2 ABSORBERS-PRODUCT COMP.

MAKEUP MGD COMPOSITION

SLURRY CONC. - 68 MGD/100ML = 9.30

MGD PRESLAKED, MG=0, YES=1 = 1

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT HG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.50

SP.GRAVITY, HYDROM. = 1.0360

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GN/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-157	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	0930	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREEN SPEED,RPM	0.4200E 03
PRI.AIR CP,H2O	0.2200E 01	PP EXIT ST,HG	-0.1200E 01	02 FURN.EX,%-RM	0.2600E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN,FX,X	0.0
SEC.AIR DP,H2O	0.2000E 01	FURN.EX,ST,H2O	0.2200E 01	ELE.CHEM.MILVULT	0.0
		PLEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1200E 03	PART.SCRUB.IN	0.4200E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7500E 03	#1 ORIFICE	0.1600E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1600E 03
ABS ORIF.INCH	0.5300E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANUMETER CODE	0	NO.1 BANK OUT	0.6900E 03	PRI.AIR FAN IN.	0.9500E 02
		NO.2 BANK OUT	0.6000E 03	PRI.AIR WGT BULB	0.7300E 02
CARD NUMBER	7	FURN. EXIT	0.4250E 03	SEC.AIR FAN IN.	0.7200E 02
MODE OF OPER.	3	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.6800E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.OP,H2O	0.5000E 01				
PART.CYC.OP,H2O	0.5000E 01				
#1 ORIF.ST,HG	-0.4000E 00				
#1 ORIF.OP,H2O	0.3200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.OP,H2O	0.0	FBA INLET ST,HG	-0.7000E 00
ABS CYC.OP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
		FBA DP,H2O	0.6200E 01
		FBA ULAST.DP,H2O	0.9000E 00

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1210E 03	PART.CYC.EXIT	0.1350E 03	PART.INIT.GAL	0.2215E 05
FBA INLET	0.1350E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2262E 05
FBA EXIT	0.1260E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.9000E 02
P.P.EXIT	0.1260E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3622E 05
PART.CYC.SUMP	0.1240E 03	FBA SUMP	0.1340E 03	ABS H2O FI.GAL	0.3630E 05
ABS CYC.SUMP	0.8000E 02	MGO SLAK TANK	0.1700E 03	ABS H2O TIME,MIN	0.9000E 02
FBA SUMP	0.1340E 03	MGOH2 TANK	0.1400E 03	MGO ROTU.SCALE,%	0.5500E 02
MGO SLAK TANK	0.1640E 03			MAKEUP SETTING	0.5500E 02
MGOH2 TANK	0.1300E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-157

DATE 4-29-76

TIME OF DAY 0930

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	479.	110.0	-----	-----	-----	-----	0.014	70.4	472.	16.3
SECONDARY AIR	4472.	737.5	-----	-----	-----	-----	0.015	73.7	4406.	7.0
FURNACE EXIT	5358.	425.0	4588.2	-----	604.	-----	0.059	116.9	5060.	2.2
PART. SCRUB. INLET	5358.	420.0	-----	-----	-----	-----	0.059	116.9	-----	2.7
PART. CYC. EXIT	4925.	135.0	4445.1	-----	693.	-----	0.095	131.8	4498.	-5.4
VENT ADS. INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC. EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	4926.	135.0	-----	-----	-----	-----	0.055	131.8	-----	-9.5
FLOATING BED EX	6303.	126.0	-----	-----	-----	-----	0.093	129.9	-----	-16.3
P.P. EXIT ORIF.	6303.	126.0	56.4	-----	693.	-----	0.093	129.9	5768.	-16.3

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
PARTICULATE	60.0	5.21	MAKEUP WATER	-----	-----	60.0	8.2
MAKEUP WATER	132.0	5.09	MAKEUP MGD SL.	-----	6.4	130.0	5.9
PRODUCT LIQ.	132.0	23.15	PRODUCT LIQ.	-----	-----	134.0	12.8
RECIRCULATED LIQ.	-----	-----	REC. (SPRAY NOZ.)	-----	-----	134.0	394.7
-----	-----	-----	REC. (FLOW NOZ.)	-----	-----	-----	478.9

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.539E 07
% FUEL AS COAL	96.4
COAL FLOW RATE, #/HR	427.0
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	12.4
UXYGEN, % DRY, MEAS.	2.60
CO2, % DRY-CALC.	15.81
HUMIDITY, #/# - CALC.	0.059

SCRUBBER PERFORMANCE

SO2 ABSORN. EFF	3.12
FLYASH COL. EFF	-----
SO3 ABSORN. EFF	-----
NOX ABSORN. EFF	-14.72
GAS VELOCITY, FPS	130.1
LIQ/GAS, GAL/MCF	17.9
LIQ/GAS, #/#	2.4
PRES. DROP, IN. WG	5.0

VENT ABS.

-----	58.69
-----	-----
-----	-----
-----	-0.14
-----	13.1
-----	34.4
-----	4.6
-----	6.2

FLOAT. BED

SC2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	-----
SULFITE/SO2-MOL/MOL	=	-----
SUMP RESID. TIME, MIN	=	-----

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	51.6
SULFITE/SO2-MOL/MOL	=	3.56
SUMP RESID. TIME, MIN	=	22.7

SULFATE FORMATION PARAMETERS

CUNC., GM-MOLE/L	=	0.0210
MUL. TOTAL SULF	=	3.50
O2 AT FURN. EX.	=	2.60
O2 AT ABSORR. IN	=	-----
O2 AT ABSORR. EX	=	-----

*** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCURBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-157

DATE 4-29-70

TIME OF DAY 0930

MATERIAL BALANCES

FURNACE		SULFUR		MAGNESIUM		FLYASH		WATER		DRY GAS	
INPUT, #/HR	15.80					31.60		278.0		5053.	
OUTPUT, #/HR	24.17					*****		297.1		5060.	
PART. SCRUBBER											
INPUT, #/HR	24.17					*****		2905.		5060.	
OUTPUT, #/HR	20.81					*****		2977.		4498.	
SO2 ABSORBERS											
INPUT, #/HR	20.81			*****		*****		1272.		4498.	
OUTPUT, #/HR	16.48			11.74		*****		1244.		5768.	

*

#SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL,	4.07	0.6355	-----
COMBINED	3.94	0.6150	-----
FREE	0.13	0.0205	-----
MONO(TOTAL)	3.80	0.5945	-----
MONO(DISSOLVED)	0.66	0.1031	1.072
MONO(SOLID)	3.14	0.4914	10.417
BISULFITE	0.68	0.0531	0.988
MGO	0.0	0.0	0.0
SULFATE	0.13	0.0210	0.252
MAGNESIUM	4.07	0.6360	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	16.096

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

#SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED	
CARBON	0.489011
HYDROGEN	0.607101
OXYGEN	1.391634
NITROGEN	5.035817
SULFUR	0.009290

FEED RATE, #/SEC= 1.48

ENTHALPY, BTU/# = -3165.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =	*****
MGO PRESLAKED, NO=0, YES=1	1
% SLAKED TO MG(OH)2, MEAS. =	8.60

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =	7.60
SP.GRAVITY, HYDROM. =	1.6030

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =	*****
FLYASH CONC. GM/100ML =	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-158	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, %SCALE	0.9900E 02
TIME	1100	BURNER DP, H2O	0.5000E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1800E 01	U2 FURN. EX. %BM	0.4800E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.4800E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2000E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2895E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1300E 03	TEMP. CONTINUED	0.4300E 03
PART. LGAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.7500E 03	PART. SCRUB. IN	0.1500E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7300E 03	#1 ORIFICE	0.1500E 03
ABS LGAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.8500E 03
ABS ORIF. INCH	0.5200E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.9700E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.6200E 03	PRI. AIR FAN IN.	0.7600E 02
CARD NUMBER	7	NO.2 BANK OUT	0.4300E 03	PRI. AIR WGT BULB	0.8200E 02
MODE OF OPER.	3	FURN. EXIT	0.1400E 03	SEC. AIR FAN IN.	0.7300E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR		SEC. AIR WGT BULB	
PART. SCR. DP, H2O	0.5200E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5100E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.7000E 00
#1 ORIF. ST, HG	-0.4000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.8000E 00
#1 ORIF. DP, H2O	0.3200E 01			FBA DP, H2O	0.6400E 01
				FBA DEMIST. DP, H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1210E 03	TEMP. THERMOMETERS, F	0.1350E 03	MAKEUP FLOWS	0.2262E 05
#1 ORIFICE	0.1350E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.2297E 05
FBA INLET	0.1250E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.6000E 02
FBA EXIT	0.1250E 03	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.3630E 05
P.P. EXIT	0.1240E 03	ABS CYC. SUMP	0.1800E 03	ABS H2O IN. GAL	0.3637E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1250E 03	ABS H2O FI. GAL	0.6000E 02
ABS CYC. SUMP	0.1320E 03	MGO SLAK TANK	0.1250E 03	ABS H2O TIME, MIN	0.3500E 02
FBA SUMP	0.1800E 03	MGOH2 TANK	0.6000E 02	MGO ROTO. SCALE, %	0.3500E 02
NGO SLAK TANK	0.1250E 03			MAKEUP SETTING	0.3500E 02
MGOH2 TANK	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-158

DATE 4-29-70

TIME OF DAY 1100

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR
13.71
23.91

MAGNESIUM

WATER
259.2
278.5

FLYASH
27.41

DRY GAS
4971.
4977.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

23.91
20.58

3202.
2981.

4977.
4477.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

20.58
18.35

1287.
1273.

4477.
5430.

*

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MULE/
LITER

GRAM/
100ML

MAKEUP MGD COMPOSITION

SLURRY CONC.- GM MGD/100ML = *****
MGD PRESLAKED, NO=0, YES=1. 1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

4.13
3.81
0.32
3.48
0.92
2.56
0.70
0.0
0.16
3.97

0.6447
0.5946
0.0501
0.5445
0.1437
0.4008
0.0547
0.0
0.0254
0.6200

1.495
8.496
1.017
0.0
0.305

11.896

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.40
SP.GRAVITY, HYDRON. = 1.0650

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-159	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.7500E 01	N.G. FLOW,%SCALE	0.9910E 02
TIME	1230	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2200E 01	SCREEN SPED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1200E 01	O2 FURN.EX,%-RM	0.2000E 01
SEC.AIR ST,HG	0.1200E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX,%	0.0
SEC.AIR DP,H2O	0.2000E 01	FURN.EX,ST,H2O	0.2500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CLLL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1300E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.7500E 03	PART.SCRUB.IN	
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7300E 03	#1 ORIFICE	0.4400E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1600E 03
ABS ORIF.INCH	0.4900E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.1400E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7200E 03	PRI.AIR FAN IN.	0.8500E 03
CARD NUMBER	7	NO.2 BANK OUT	0.6400E 03	PRI.AIR WCT BULB	0.9800E 02
MODE OF OPER.	3	FURN. EXIT	0.4400E 03	SEC.AIR FAN IN.	0.7700E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR	0.1400E 03	SEC.AIR WET BULB	0.7800E 02
PART.SCR.OP,H2O	0.4800E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.OP,H2O	0.3500E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.6000E 00
#1 ORIF.ST,HG	-0.2000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
#1 ORIF.OP,H2O	0.3100E 01	CARD NUMBER	11	FBA DP,H2O	0.6200E 01
CARD NUMBER	10	TEMP.THERMOMETERS,F	0.1400E 03	FBA DEMIST.DP,H2O	0.9000E 00
TEMP.PILOT RECORDER,F	0.1120E 03	PART.CYC.EXIT	0.0	CARD NUMBER	12
#1 ORIFICE	0.1400E 03	ABS CYC.EXIT	0.0	MAKUP FLOWS	
FBA INLET	0.1300E 03	PART.CYC.SUMP	0.0	PART.INIT.GAL	0.2296E 05
FBA EXIT	0.1300E 03	ABS CYC.SUMP	0.1350E 03	PART.FINAL,GAL	0.2327E 05
P.P.EXIT	0.1260E 03	FBA SUMP	0.0	PART.TIME,MIN	0.6000E 02
PART.CYC.SUMP	0.8800E 02	MGO SLAK TANK	0.1500E 03	ABS H2O IN,GAL	0.3637E 05
ABS CYC.SUMP	0.1350E 03	MGOH2 TANK	0.0	ABS H2O FI,GAL	0.3643E 05
FBA SUMP	0.0	MAKEUP WATER	0.1420E 03	ABS H2O TIME,MIN	0.6000E 02
MGO SLAK TANK	0.1420E 03		0.6200E 02	MGO ROTO.SCALE,%	0.5600E 02
MGOH2 TANK	0.6200E 02			MAKEUP SETTING	0.5600E 02

RUN NUMBER L-159

DATE 4-29-70

TIME OF DAY 1230

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NUX PPM	FLYASH GR/LSCF	HUM. #/H	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	487.	140.0	---	---	---	---	0.016	76.0	479.	16.3
SECONDARY AIR	4427.	737.6	---	---	---	---	0.015	74.2	4359.	7.5
FURNACE EXIT	5330.	440.0	4607.5	6.6	***	***	0.061	118.0	5025.	2.5
PART. SCR.B. INLET	5330.	440.0	***	***	***	***	0.061	118.0	---	1.4
PART. CYC. EXIT	4843.	140.0	4538.4	***	***	***	0.100	133.9	4401.	-2.7
VENT ABS. INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC. EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	4843.	140.0	***	***	***	***	0.100	133.9	---	-8.1
FLOATING BED EX	5980.	130.0	***	***	***	***	0.094	130.5	---	-16.3
P.P. EXIT GRIF.	5980.	130.0	65.3	***	***	***	0.094	130.5	5466.	-16.3

SCRUBBER STREAM DATA

RUBBER STREAM DATA					
	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FRA
ARTICULATE	62.0	5.16	MAKEUP WATER	TEMP,F	TEMP,F FLOW,#/M
MAKEUP WATER	134.0	5.09	MAKEUP MGO SL.	*****	7.8
PRODUCT LIQ.	134.0	23.15	PRODUCT LIQ.	6.4	6.0
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	15.7
			REC.(FLOW NOZ.)	*****	394.7
				*****	460.4

FURNACE PERFORMANCE

ERNACE PERFORMANCE	0.552E 07
HEAT RELEASE,BTU/HR	96.4
% FUEL AS COAL	437.2
COAL FLOW RATE,#/HR	9.0
NAT.GAS FLOW,#/HR	9.5
% EXCESS AIR	2.00
OXYGEN,% DRY, MEAS.	16.33
CO2,% DRY-CALC.	0.061
HUMIDITY, #/# - CALC.	

SCRUBBER PERFORMANCE

SCRUBBER PERFORMANCE	PART.
S02 ABSORB.EFF	1.50
FLYASH COL.EFF	*****
S03 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	128.3
LIQ/GAS,GAL/MCF	18.2
LIQ/GAS,#/#	2.4
PRES.DROP,IN.WG	4.8

VENT ABS.

[illegible]

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

SULFATE FORMATION PARAMETERS

ENVIRONMENTAL ORDER	CONC., GM-MOLE/L	MOL % TOTAL SULF	02 AT FURN.	02 AT ABSORB.	02 AT ABSORB.
KGA, #MOLE/HR-FT2,	47.8				
SULFITE/SO2-MCL/MOL	3.76				
SUMP RESID.TIME, MIN	20.9				

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-159

DATE 4-29-70

TIME OF DAY 1230

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	16.17	-----	-----	32.35	284.9	5017.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	24.05	-----	-----	*****	304.2	5025.	CARBON 0.503327
							HYDROGEN 0.648366
PART. SCRUBBER							OXYGEN 1.389942
INPUT, #/HR	24.05	-----	-----	*****	2885.	5025.	NITROGEN 5.022643
OUTPUT, #/HR	20.75	-----	-----	*****	2990.	4401.	SULFUR 0.009565

FEED RATE, #/SEC= 1.47

ENTHALPY, BTU/# = 3750.

*

*SO2 ABSORBERS- PRODUCT COMP.

INPUT, #/HR	20.75	*****	GRAM/	MAKEUP MGO COMPOSITION
OUTPUT, #/HR	20.04	13.15	100ML	SLURRY CONC.- GM MGO/100ML = *****
				MGO PRESLAKED, NO=0, YES=1 *****
				% SLAKED TO MG(OH)2, MEAS. = *****
TOTAL,	4.11	0.6415	-----	
COMBINED	3.64	0.5695	-----	
FREE	0.46	0.0720	-----	
MUNO(TOTAL)	3.18	0.4975	-----	
MUNO(DISSOLVED)	0.70	0.1094	-----	
MUNO(SOLID)	2.48	0.3881	1.137	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	1.36	0.1063	8.228	ACID STRENGTH, PH = 7.20
MGO	0.0	0.0	1.976	SP.GRAVITY, HYDROM. = 1.6050
SULFATE	0.08	0.0125	0.0	
MAGNESIUM	3.72	0.5819	0.150	PARTICULATE SCRUBBER PRODUCT
FLYASH	-----	-----	-----	ACID STRENGTH, PH = *****
SOLIDS, MG	-----	-----	*****	FLYASH CONC. GM/100ML = 0.67

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-160	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	1400	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.9000E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000F 01	SCREW SPEED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1200E 01	02 FURN.EX.8-3M	0.2000E 01
SEC.AIR ST,HG	0.1200E 01	PP EXIT DP,H2O	0.5000E 01	COMB.FURN,FX.8	0.0
SEC.AIR DP,H2O	0.2000E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR GRIF.	0.1300E 03	PART.SCRUB.IN	0.4400E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7500E 03	#1 ORIFICE	0.1600E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.1600E 03
ABS GRIF.INCH	0.5400E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7600E 03	PRI.AIR FAN IN.	0.9800E 02
CARD NUMBER	7	NO.2 BANK OUT	0.6500E 03	PRI.AIR WGT BULB	0.7700E 02
MODE OF OPER.	3	FURN. EXIT	0.4400E 03	SEC.AIR FAN IN.	0.8100E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1400E 03	SEC.AIR WET BULB	0.7000E 02
PART.SCR.DP,H2O	0.4400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5000E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.9000E 00
#1 ORIF.ST,HG	-0.6000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
#1 ORIF.DP,H2O	0.3200E 01			FBA DP,H2O	0.6000E 01
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1120E 03	PART.CYC.EXIT	0.1400E 03	PART.INIT.GAL	0.2327E 05
FBA INLET	0.1400E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2369E 05
FBA EXIT	0.1300E 03	PART.CYC.SUMP	0.1350E 03	PART.TIME,MIN	0.7500E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3643E 05
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.1350E 03	ABS H2O FI.GAL	0.3654E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.7500E 02
FBA SUMP	0.1350E 03	MGOH2 TANK	0.1420E 03	MGO ROTO.SCALE,%	0.7200E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.7200E 02
MGOH2 TANK	0.1360E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-160

DATE 4-29-70

TIME OF DAY 1400

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	467.	140.0	----	----	----	----	0.016	76.0	470.	16.3
SECONDARY AIR	4427.	732.5	----	----	----	----	0.015	73.0	4363.	7.0
FURNACE EXIT	5331.	440.0	4444.6	----	----	----	0.060	117.7	5029.	2.2
PART.SCRB.INLET	5331.	440.0	-----	-----	-----	-----	0.060	117.7	-----	2.7
PART.CYC.EXIT	4884.	140.0	4378.0	-----	-----	-----	0.101	133.7	4435.	-8.1
VENT ABS.INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC.EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	4884.	140.0	-----	-----	-----	-----	0.101	133.7	-----	-12.2
FLOATING BED EX	6092.	130.0	-----	-----	-----	-----	0.101	132.7	-----	-16.3
P.P. EXIT ORIF.	6092.	130.0	53.5	-----	-----	-----	0.101	132.7	5535.	-16.3

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE	62.0	5.53	-----	62.0	11.9	62.0	11.9
MAKEUP WATER	135.0	5.09	-----	136.0	7.2	136.0	7.2
PRODUCT LIQ.	135.0	23.15	-----	135.0	15.0	135.0	15.0
RECIRCULATED LIQ.	-----	-----	REC.(SPRAY NOZ)	135.0	394.7	135.0	394.7
-----	-----	-----	REC.(FLOW NOZ.)	-----	483.3	-----	483.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.552E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	437.5
NAT.GAS FLOW,#/HR	9.0
% EXCESS AIR	9.5
OXYGEN,% DRY, MEAS.	2.00
CO2,% DRY-CALC.	16.33
HUMIDITY,#/# - CALC.	0.060

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	1.50
FLYASH COL.EFF	-----
SO3 ABSORB.EFF	-----
NOX ABSORB.EFF	-----
GAS VELOCITY,FPS	131.3
LIQ/GAS,GAL/MCF	17.8
LIQ/GAS,#/#	2.4
PRES.DROP,IN.WG	4.4

VENT AHS.

VENT AHS.	98.78
-----	-----
-----	-----
-----	-----
-----	-----
-----	12.7
-----	35.5
-----	4.8
-----	6.0

FLOAT.BED

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
 SULFITE/SC2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****
 ***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 50.2
 SULFITE/SO2-MOL/MOL = 5.42
 SUMP RESID.TIME,MIN = 20.2

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L= 0.0128
 MOL% TOTAL SULF= 1.89
 O2 AT FURN.EX.= 2.00
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER 1-160

DATE 4-29-70

TIME OF DAY 1400

MATERIAL BALANCES

FURNACE

INPUT, #/HR 16.19

OUTPUT, #/HR 23.22

PART. SCRUBBER

INPUT, #/HR 23.22

OUTPUT, #/HR 20.17

SO2 ABSORBERS

INPUT, #/HR 20.17

OUTPUT, #/HR 21.16

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,

COMBINED

FREE

MONO(TOTAL)

MONO(DISSOLVED)

MONO(SOLID)

BISULFITE

MGO

SULFATE

MAGNESIUM

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.503324

HYDROGEN 0.648377

OXYGEN 1.389940

NITROGEN 5.022645

SULFUR 0.009565

FEED RATE, #/SEC= 1.47

ENTHALPY, BTU/# = -3595.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****

MGO PRESLAKED, NO=0, YES=1 1

% SLAKED TO MG(OH)2, MEAS. = 9.00

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.40

SP. GRAVITY, HYDRUM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

* *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-161	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	1530	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1800E 01	O2 FURN.EX,%-BM	0.2800E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	CLMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.2200E 01	ELF.CHEM.MILVULT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2896E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F	0.1400E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR CRIF.	0.7600E 03	PART.SCRUB.IN	0.4000E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7300E 03	#1 GRIFICE	0.1600E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1600E 03
ABS CRIF.INCH	0.5200E 01	WINDBOX-BOT.	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.6600E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.5600E 03	PRI.AIR FAN IN.	0.9600E 02
CARD NUMBER	7	NO.2 BANK OUT	0.4500E 03	PRI.AIR WGT BULB	0.7800E 02
MODE OF OPER.	3	FURN. EXIT	0.1400E 03	SEC.AIR FAN IN.	0.8100E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR		SFC.AIR WET BULB	0.7100E 02
PART.SCR.DP,H2O	0.4200E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5200E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.9000E 00
#1 GRIF.ST,HG	-0.6000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.9000E 00
#1 GRIF.DP,H2O	0.3200E 01			FBA DP,H2O	0.6000E 01
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 GRIFICE	0.1120E 03	PART.CYC.EXIT	0.1450E 03	PART.INIT.GAL	0.2369E 05
FBA INLET	0.1450E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2419E 05
FBA EXIT	0.1280E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.9000E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3654E 05
PART.CYC.SUMP	0.1240E 03	FBA SUMP	0.1320E 03	ABS H2O FI.GAL	0.3660E 05
ABS CYC.SUMP	0.9000E 02	MGO SLAK TANK	0.2000E 03	ABS H2O TIME,MIN	0.9000E 02
FBA SUMP	0.1320E 03	MGOH2 TANK	0.1350E 03	MGO ROTO.SCALE,%	0.7000E 02
MGO SLAK TANK	0.1980E 03			MAKEUP SETTING	0.7000E 02
MGOH2 TANK	0.1310E 03				
MAKEUP WATER	0.6000E 02				

TIME OF DAY 1530

FLUE GAS DATA

VALUE GAS DATA	FLOW #/HR	TEMP. F	SU2 PPM	SC3 PPM	NUX PPM	FLY/ASH GR/DSCF	HUM. #/H	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	477.	140.0	---	---	---	---	0.017	77.6	469.	16.3
SECONDARY AIR	4620.	742.5	---	---	---	---	0.016	74.7	4549.	7.0
FURNACE EXIT	5510.	450.0	4201.3	0.0	***	***	0.059	117.1	5203.	2.2
PART. SCR.B. INLET	5510.	400.0	***	***	***	***	0.059	117.1	---	2.7
PART. CYC. EXIT	4873.	145.0	4175.6	***	***	***	0.091	130.2	4465.	-8.1
VENT ABS. INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC. EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	4873.	145.0	***	***	***	***	0.091	130.2	---	-12.2
FLOATING BED EX	6047.	128.0	***	***	***	***	0.091	128.4	---	-24.4
P.P. EXIT ORIF.	6047.	128.0	30.6	***	***	***	0.091	128.4	5544.	-24.4

SCRUBBER STREAM DATA

LUBBER STREAM DATA			VENTURI ABSORBER			FRA		
ARTICULATE	TEMP, F	FLOW, GPM	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
MAKEUP WATER	60.0	5.54	60.0	***	60.0	5.8		
PRODUCT LIQ.	132.0	5.09	131.0	6.4	131.0	7.0		
RECIRCULATED LIQ.	132.0	23.15	132.0	***	132.0	12.8		
				***	132.0	394.7		
				***		474.3		

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.549E 07
% FUEL AS COAL	96.4
COAL FLOW RATE, #/HR	434.5
NAT. GAS FLOW, #/HR	9.0
% EXCESS AIR	13.3
OXYGEN, % DRY, MEAS.	2.80
CO2, % DRY-CALC.	15.64
HUMIDITY, #/# - CALC.	0.059

SC2 ABSORPTION PARAMETERS

ABSORPTION PARAMETER
VENTURI ABSORBER

FLGATING BED ABSORBER

KGA, #MULE/HR-FT2,	*****	KGA, #MULE/HR-FT2	=	56.3
SULFITE/SC2-MUL/MCL	*****	SULFITE/SC2-MCL/MCL	=	5.73
SUMP RESID.TIME,MIN	*****	SUMP RESID.TIME,MIN	=	22.7

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0157
MUL% TOTAL SULF=	2.01
Q2 AT FURN. EX.=	2.80
Q2 AT ABSORB.IN=	*****
Q2 AT ABSORB.EX=	*****

####	MEANS	ITEM	NUT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-161

DATE 4-29-70

TIME OF DAY 1530

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.	
INPUT, #/HR	16.08			32.16	287.6	5195.	INPUT FLOWS, #ATOMS/100#FEED	
OUTPUT, #/HR	22.77			*****	307.0	5203.	CARBON 0.484265	
PART. SCRUBBER							HYDROGEN 0.640054	
INPUT, #/HR	22.77			*****	3081.	5203.	OXYGEN 1.392206	
OUTPUT, #/HR	19.42			*****	2957.	4465.	NITROGEN 5.040184	
SO2 ABSORBERS							SULFUR 0.009201	
INPUT, #/HR	19.42						FEED RATE, #/SEC= 1.52	
OUTPUT, #/HR	20.91						ENTHALPY, BTU/# = -3201.	

*SD2 ABSORBERS-PRODUCT COMP.

TOTAL,	5.30	GM SO2/	GM-MOLE/	GRAM/	MAKEUP MGO COMPOSITION	
COMBINED	5.30	100ML	LITER	100ML	SLURRY CONC. - GM MGO/100ML =	
FREE	0.0				MGO PRESLAKED, NO=0, YES=1	
MONO(TOTAL)	5.30				% SLAKED TO MG(UH)2, MEAS. =	
MONO(DISSOLVED)	0.97				PRODUCT MG BASE PHYSICAL PROPERTIES	
MONO(SOLID)	4.33				ACID STRENGTH, PH = 8.40	
BISULFITE	0.0				SP.GRAVITY, HYDROM. = 1.0450	
MGO	0.24				PARTICULATE SCRUBBER PRODUCT	
SULFATE	0.10				ACID STRENGTH, PH =	
MAGNESIUM	5.64				FLYASH CONC. GM/100ML =	
FLYASH					*****	
SOLIDS, MG					*****	

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	L-162 4-29-7C 1700	CARD NUMBER WINDBOX ST, H2O BURNER DP, H2O FURN. ST, H2O PP EXIT ST, HG PP EXIT DP, H2O FURN. EX. ST, H2O PEEPSITE DP, HG P. SITE ST, PSIG	2 0.7000E 01 0.5000E 01 0.3000E 01 - .1800E 01 0.5000E 01 0.3200E 01 0.0 0.0	CARD NUMBER N.G. FLOW, %SCALE N.G. STATIC, R.D. SCREW SPEED, RPM O2 FURN. EX. % - GM COMB. FURN. EX. % ELC. CHEM. MILVOLT CELL TEMP, F BAROMETRIC, HG	3 0.9900E 02 0.9400E 01 0.4100E 03 0.3000E 01 0.0 0.0 0.0 0.2895E 02
CARD NUMBER PART. NOZ., PSIG PART. LOAD, PSIG ABS NOZ., PSIG ABS LOAD, PSIG ABS ORIF. INCH ABSORBER NOZ. CODE MANOMETER CODE	4 0.4000E 02 0.4200E 02 0.2700E 02 0.5000E 02 0.5200E 01 1 0	CARD NUMBER TEMP. FURN. RECORDER, F SEC. AIR ORIF. WINDBOX-TUP WINDBOX-WEST WINDBOX-BOT. WINDBOX-EAST NO. 1 BANK OUT NO. 2 BANK OUT FURN. EXIT COAL-AIR	5 0.1400E 03 0.7600E 03 0.7300E 03 0.7300E 03 0.7400E 03 0.7400E 03 0.5900E 03 0.4200E 03 0.1400E 03	CARD NUMBER TEMP. CONTINUED PART. SCRUB. IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI. AIR FAN IN. PRI. AIR WGT BULB SEC. AIR FAN IN. SEC. AIR WET BULB	6 0.4100E 03 0.1600E 03 0.1600E 03 0.8500E 03 0.8500E 03 0.9800E 02 0.7800E 02 0.7600E 02 0.6900E 02
CARD NUMBER MODE OF OPER. PART. SCR. ST, HG PART. SCR. DP, H2O PART. CYC. DP, H2O #1 ORIF. ST, HG #1 URIF. DP, H2O	7 0.2000E 00 0.4000E 01 0.5000E 01 - .6000E 00 0.3400E 01	CARD NUMBER VENT. ABS. DP, H2O ABS CYC. DP, H2O	8 0.0 0.0	CARD NUMBER FBA INLET ST, HG FBA SUMP DP, H2O FBA DP, H2O FBA DEMIST. DP, H2O	9 - .9000E 00 0.1000E 01 0.6200E 01 0.9000E 00
CARD NUMBER TEMP. PILOT RECORDER, F #1 ORIFICE FBA INLET FBA EXIT P. P. EXIT PART. CYC. SUMP ABS CYC. SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 0.1380E 03 0.1380E 03 0.1300E 03 0.1300E 03 0.1300E 03 0.0 0.1380E 03 0.1900E 03 0.1300E 03 0.6200E 02	CARD NUMBER TEMP. THERMOMETERS, F PART. CYC. EXIT ABS CYC. EXIT PART. CYC. SUMP ABS CYC. SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 0.1380E 03 0.0 0.1340E 03 0.0 0.1380E 03 0.1900E 03 0.1320E 03	CARD NUMBER MAKEUP FLOWS PART. INIT. GAL PART. FINAL, GAL PART. TIME, MIN ABS H2O IN. GAL ABS H2O FI. GAL ABS H2O TIME, MIN MGO ROTO. SCALE, % MAKEUP SETTING	12 0.2419E 05 0.2449E 05 0.7500E 02 0.3660E 05 0.3669E 05 0.7500E 02 0.6000E 02 0.6000E 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

STAT

P.P. EXIT ORIE.

RECIRCULATED LIQ.

HUMIDITY, #/W - CALC.

*****	MEANS	ITEM	NOT	MEASURED
1	1.0	1.0	1.0	1.0
2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0
4	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0
6	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0
8	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0
10	1.0	1.0	1.0	1.0
11	1.0	1.0	1.0	1.0
12	1.0	1.0	1.0	1.0
13	1.0	1.0	1.0	1.0
14	1.0	1.0	1.0	1.0
15	1.0	1.0	1.0	1.0
16	1.0	1.0	1.0	1.0
17	1.0	1.0	1.0	1.0
18	1.0	1.0	1.0	1.0
19	1.0	1.0	1.0	1.0
20	1.0	1.0	1.0	1.0
21	1.0	1.0	1.0	1.0
22	1.0	1.0	1.0	1.0
23	1.0	1.0	1.0	1.0
24	1.0	1.0	1.0	1.0
25	1.0	1.0	1.0	1.0
26	1.0	1.0	1.0	1.0
27	1.0	1.0	1.0	1.0
28	1.0	1.0	1.0	1.0
29	1.0	1.0	1.0	1.0
30	1.0	1.0	1.0	1.0
31	1.0	1.0	1.0	1.0
32	1.0	1.0	1.0	1.0
33	1.0	1.0	1.0	1.0
34	1.0	1.0	1.0	1.0
35	1.0	1.0	1.0	1.0
36	1.0	1.0	1.0	1.0
37	1.0	1.0	1.0	1.0
38	1.0	1.0	1.0	1.0
39	1.0	1.0	1.0	1.0
40	1.0	1.0	1.0	1.0
41	1.0	1.0	1.0	1.0
42	1.0	1.0	1.0	1.0
43	1.0	1.0	1.0	1.0
44	1.0	1.0	1.0	1.0
45	1.0	1.0	1.0	1.0
46	1.0	1.0	1.0	1.0
47	1.0	1.0	1.0	1.0
48	1.0	1.0	1.0	1.0
49	1.0	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0
51	1.0	1.0	1.0	1.0
52	1.0	1.0	1.0	1.0
53	1.0	1.0	1.0	1.0
54	1.0	1.0	1.0	1.0
55	1.0	1.0	1.0	1.0
56	1.0	1.0	1.0	1.0
57	1.0	1.0	1.0	1.0
58	1.0	1.0	1.0	1.0
59	1.0	1.0	1.0	1.0
60	1.0	1.0	1.0	1.0
61	1.0	1.0	1.0	1.0
62	1.0	1.0	1.0	1.0
63	1.0	1.0	1.0	1.0
64	1.0	1.0	1.0	1.0
65	1.0	1.0	1.0	1.0
66	1.0	1.0	1.0	1.0
67	1.0	1.0	1.0	1.0
68	1.0	1.0	1.0	1.0
69	1.0	1.0	1.0	1.0
70	1.0	1.0	1.0	1.0
71	1.0	1.0	1.0	1.0
72	1.0	1.0	1.0	1.0
73	1.0	1.0	1.0	1.0
74	1.0	1.0	1.0	1.0
75	1.0	1.0	1.0	1.0
76	1.0	1.0	1.0	1.0
77	1.0	1.0	1.0	1.0
78	1.0	1.0	1.0	1.0
79	1.0	1.0	1.0	1.0
80	1.			

accn:n

PRES. GROUP, INC. WG

4.0

6.2

*****	MEANS	ITEM	NOT	MEASURED
1	1.0	1.0	1.0	1.0
2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0
4	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0
6	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0
8	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0
10	1.0	1.0	1.0	1.0
11	1.0	1.0	1.0	1.0
12	1.0	1.0	1.0	1.0
13	1.0	1.0	1.0	1.0
14	1.0	1.0	1.0	1.0
15	1.0	1.0	1.0	1.0
16	1.0	1.0	1.0	1.0
17	1.0	1.0	1.0	1.0
18	1.0	1.0	1.0	1.0
19	1.0	1.0	1.0	1.0
20	1.0	1.0	1.0	1.0
21	1.0	1.0	1.0	1.0
22	1.0	1.0	1.0	1.0
23	1.0	1.0	1.0	1.0
24	1.0	1.0	1.0	1.0
25	1.0	1.0	1.0	1.0
26	1.0	1.0	1.0	1.0
27	1.0	1.0	1.0	1.0
28	1.0	1.0	1.0	1.0
29	1.0	1.0	1.0	1.0
30	1.0	1.0	1.0	1.0
31	1.0	1.0	1.0	1.0
32	1.0	1.0	1.0	1.0
33	1.0	1.0	1.0	1.0
34	1.0	1.0	1.0	1.0
35	1.0	1.0	1.0	1.0
36	1.0	1.0	1.0	1.0
37	1.0	1.0	1.0	1.0
38	1.0	1.0	1.0	1.0
39	1.0	1.0	1.0	1.0
40	1.0	1.0	1.0	1.0
41	1.0	1.0	1.0	1.0
42	1.0	1.0	1.0	1.0
43	1.0	1.0	1.0	1.0
44	1.0	1.0	1.0	1.0
45	1.0	1.0	1.0	1.0
46	1.0	1.0	1.0	1.0
47	1.0	1.0	1.0	1.0
48	1.0	1.0	1.0	1.0
49	1.0	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0
51	1.0	1.0	1.0	1.0
52	1.0	1.0	1.0	1.0
53	1.0	1.0	1.0	1.0
54	1.0	1.0	1.0	1.0
55	1.0	1.0	1.0	1.0
56	1.0	1.0	1.0	1.0
57	1.0	1.0	1.0	1.0
58	1.0	1.0	1.0	1.0
59	1.0	1.0	1.0	1.0
60	1.0	1.0	1.0	1.0
61	1.0	1.0	1.0	1.0
62	1.0	1.0	1.0	1.0
63	1.0	1.0	1.0	1.0
64	1.0	1.0	1.0	1.0
65	1.0	1.0	1.0	1.0
66	1.0	1.0	1.0	1.0
67	1.0	1.0	1.0	1.0
68	1.0	1.0	1.0	1.0
69	1.0	1.0	1.0	1.0
70	1.0	1.0	1.0	1.0
71	1.0	1.0	1.0	1.0
72	1.0	1.0	1.0	1.0
73	1.0	1.0	1.0	1.0
74	1.0	1.0	1.0	1.0
75	1.0	1.0	1.0	1.0
76	1.0	1.0	1.0	1.0
77	1.0	1.0	1.0	1.0
78	1.0	1.0	1.0	1.0
79	1.0	1.0	1.0	1.0
80	1.			

02 AT ABSORH.EX=*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-162

DATE 4-29-70

TIME OF DAY 1700

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROC.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR
15.53
23.01

MAGNESIUM

FLYASH
31.06

WATER
276.3
295.7

DRY GAS
5076.
5084.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

23.01
21.17

2311.
2947.

5084.
4660.

SU2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

21.17

15.61

1367.
1183.

4660.
5581.

FEED RATE, #/SEC = 1.48

ENTHALPY, BTU/# = -2909.

* SU2 ABSORBERS -
PRODUCT COMP.

GM SU2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

5.08
5.08
0.0
5.08
1.16
3.92
0.14
0.20
0.0
5.28

0.7938
0.7938
0.0
0.7938
0.1812
0.6125
0.0109
0.0319
0.0
0.8257

1.885
12.986
0.203
0.128
0.0

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****
MGO PRESLAKED, NU=0, YES=1 I
% SLAKED TO MG(UH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.00
SP. GRAVITY, HYDROM. = 1.0510

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-163	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.7500E 01	N.G. FLOW,%SCALE	0.9900E 02
TIME	1830	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.3000E 01	SCREEN SPEED,RPM	0.4100E 03
PRI.AIR DP,H2O	0.2600E 01	PP EXIT ST,HG	-0.1200E 01	02 FURN.EX.%-BM	0.3000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	CDMB.FURN,FX.%	0.0
SEC.AIR DP,H2O	0.2000E 01	FURN.EX.ST,H2O	0.3200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1400E 03	PART.SCRUB.IN	0.4200E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.1600E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1600E 03
ABS ORIF.INCH	0.5200E 01	WINDBOX-BUT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7200E 03	PRI.AIR FAN IN.	0.9700E 02
		NO.2 BANK OUT	0.6200E 03	PRI.AIR WGT BULB	0.7600E 02
CARD NUMBER	7	FURN. EXIT	0.4400E 03	SEC.AIR FAN IN.	0.7800E 02
MODE CF OPER.	3	COAL-AIR	0.1400E 03	SEC.AIR WGT BULB	0.6400E 02
PART.SCR.ST,HG	0.2000E 00				
PART.SCR.DP,H2O	0.5000E 01				
PART.CYC.DP,H2O	0.5000E 01				
#1 CRIF.ST,HG	-0.6000E 00				
#1 URIF.DP,H2O	0.3400E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.6000E 00
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.8000E 00
		FBA DP,H2O	0.6200E 01
		FBA DENIST.DP,H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1140E 03	PART.CYC.EXIT	0.1350E 03	PART.INIT.GAL	0.2449E 05
FBA INLET	0.1350E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2476E 05
FBA EXIT	0.1300E 03	PART.CYC.SUMP	0.1340E 03	PART.TIME,MIN	0.6000E 02
P.P.EXIT	0.1300E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.3669E 05
PART.CYC.SUMP	0.1280E 03	FBA SUMP	0.1350E 03	ABS H2O FI,GAL	0.3672E 05
ABS CYC.SUMP	0.9000E 02	MGO SLAK TANK	0.0	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1350E 03	MGOH2 TANK	0.1500E 03	MGO RCTU.SCALE,%	0.6500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.6500E 02
MGOH2 TANK	0.1500E 03				
MAKEUP WATER	0.6200E 02				

RUN NUMBER L-163

RUN NUMBER L-163

DATE 4-29-70

TIME OF DAY 1830

FLUE GAS DATA

UNIT	TEMP. °F	SU2. PPM	SU3. PPM	NUX. PPM	FLYASH GR/DSCF	HUM. #/100	DEW POINT °F	DRY FLOW #/HR	STAT PRES IN. H ₂ O
PRIMARY AIR	507.	140.0	---	---	---	0.016	74.7	499.	16.3
SECONDARY AIR	4410.	747.5	---	---	---	0.011	64.5	4362.	7.5
FURNACE EXIT	5313.	440.0	***	***	***	0.055	114.6	5038.	3.2
PART. SCR.B. INLET	5313.	420.0	***	***	***	0.055	114.6	---	2.7
PART. CYC. EXIT	5069.	135.0	***	***	***	0.087	128.5	4665.	-8.1
VENT ABS. INLET	***	***	***	***	***	***	***	---	***
ABS CYC. EXIT	***	***	***	***	***	***	***	---	***
FLOATING BED IN	5069.	135.0	***	***	***	0.087	128.5	---	-8.1
FLOATING BED EX	6116.	130.0	***	***	***	0.082	125.9	---	-16.3
P.P. EXIT CRIF.	6116.	130.0	***	***	***	0.092	125.9	5652.	-16.3

SCRUBBER STREAM DATA

ARTICULATE		VENTURI ABSORBER		FBA	
MAKEUP WATER	TEMP, F	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/N
PRODUCT LIQ.	62.0	***	***	62.0	5.0
RECIRCULATED LIQ.	134.0	***	***	150.0	6.6
	134.0	***	***	135.0	14.3
		***	***	135.0	394.7
		***	***		474.3

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.526E 07
% FUEL AS CCLAL	96.2
COAL FLOW RATE, #/HR	415.8
NAT. GAS FLOW, #/HR	9.0
% EXCESS AIR	14.3
OXYGEN, % DRY, MEAS.	3.00
CO2, % DRY-CALC.	15.46
HUMIDITY, #/# - CALC.	0.055

SO₂ ABSORPTION PARAMETERS

VENTURI ABSCREBEN

KGA, #MOLE/HR-FT2,	=	*****
SULFITE/SC2-MCL/MOL	=	*****
SUMP RESID.TIME, MIN	=	*****

*** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

S02 ABSORB.EFF	7.61
FLYASH COL.EFF	***
S03 ABSORB.EFF	***
NOX ABSORB.EFF	***
GAS VELOCITY,FPS	134.4
LIQ/GAS,GAL/MCF	17.4
LIQ/GAS,#/#	2.3
PRES.DRUP,IN.WG	5.0

FLOATING BED ABSORBER

KGA, MMOLE/HR-FT2	=	44.4
SULFITE/SC2-MOL/MOL	=	5.62
SUMP RESID. TIME, MIN	=	22.9

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L =	0.0221
MDL% TOTAL SULF =	2.71
02 AT FURN. EX. =	3.00
02 AT ABSORB. IN =	*****
02 AT ABSORB. EX =	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-163

DATE 4-29-70

TIME OF DAY 1830

MATERIAL BALANCES

FURNACE

INPUT, #/HR 15.39

OUTPUT, #/HR 24.44

PART. SCRUBBER

INPUT, #/HR 24.44

OUTPUT, #/HR 20.91

SO2 ABSORBERS

INPUT, #/HR 20.91

OUTPUT, #/HR 25.15

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL, 5.59

COMBINED 5.19

FREE 0.39

MONO(TOTAL) 4.80

MONO(DISSOLVED) 1.00

MONO(SOLID) 3.80

BISULFITE 0.86

MGO 0.0

SULFATE 0.14

MAGNESIUM 5.33

FLYASH

SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

OXY+NIT 0.0817

SULFUR 0.0370

ASH 0.0740

WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS

15.39 30.77 255.6 5031.

24.44 5038.

24.44 2527. 5038.

20.91 2953. 4665.

20.91 1105. 4665.

25.15 1240. 5652.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =

MGO PRESLAKED, NC=0, YES=1

% SLAKED TO Mg(OH)2, NEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =

SP.GRAVITY, HYDROM. =

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =

FLYASH CONC. GM/100ML =

INPUT FOR EO. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.479227

HYDROGEN 0.620705

OXYGEN 1.392755

NITROGEN 5.044832

SULFUR 0.009097

FEED RATE, #/SEC= 1.47

ENTHALPY, BTU/# = -1005.

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML =

MGO PRESLAKED, NC=0, YES=1

% SLAKED TO Mg(OH)2, NEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =

SP.GRAVITY, HYDROM. =

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =

FLYASH CONC. GM/100ML =

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-164	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.8400E 01	N.G. FLOW,%SCALE	0.9700E 02
TIME	2000	BURNER DP,H2O	0.5000E 01	N.G. STATIC,R.O.	0.8100E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2500E 01	SCREEN SPEED,RPM	0.4700E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1200E 01	C2 FURN.LX,%-BM	0.2000E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5100E 01	CUMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2000E 01	FURN.EX,ST,H2O	0.2500E 01	ELE.CHEM.NILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2896E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LCAD,PSIG	0.4200E 02	SEC.AIR ORIF.	0.1300E 03	PART.SCRUB.IN	0.4800E 03
ABS NOZ.,PSIG	0.2750E 02	WINDBOX-TOP	0.7550E 03	#1 CRIFICE	0.1450E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.1000E 03
ABS ORIF.INCH	0.4800E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7500E 03	PRI.AIR FAN IN.	0.9500E 02
CARD NUMBER	7	NO.2 BANK OUT	0.6400E 03	PRI.AIR WGT BULB	0.7500E 02
MODE OF OPER.	3	FURN. EXIT	0.4400E 03	SEC.AIR FAN IN.	0.7400E 02
PART.SCR.ST,HG	0.1000E 00	COAL-AIR	0.1400E 03	SEC.AIR WET BULB	0.7000E 02
PART.SCR.DP,H2O	0.4600E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.UP,H2O	0.5000E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.8000E 00
#1 ORIF.ST,HG	-0.6000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1000E 01
#1 ORIF.DP,H2O	0.3300E 01			FBA DP,H2O	0.5800E 01
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 CRIFICE	0.1100E 03	PART.CYC.EXIT	0.1400E 03	PART.INIT.GAL	0.2476E 05
FBA INLET	0.1400E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2513E 05
FBA EXIT	0.1320E 03	PART.CYC.SUMP	0.1340E 03	PART.TIME,MIN	0.7500E 02
P.P.EXIT	0.1320E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.3672E 05
PART.CYC.SUMP	0.1300E 03	FBA SUMP	0.1340E 03	ABS H2O FI,GAL	0.3676E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.9300E 02	ABS H2O TIME,MIN	0.7500E 02
FBA SUMP	0.1340E 03	MGOH2 TANK	0.1470E 03	MGO AUTO.SCALE,%	0.6900E 02
MGO SLAK TANK	0.9400E 02			MAKEUP SETTING	0.6900E 02
MGOH2 TANK	0.1430E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAG

RUN NUMBER L-164

DATE 4-29-70 TIME OF DAY 2000

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	478.	140.0	---	---	---	---	0.015	73.8	471.	17.6
SECONDARY AIR	4441.	733.8	---	---	---	---	0.016	75.9	4370.	8.4
FURNACE EXIT	5335.	440.0	5106.1	---	---	---	0.061	118.3	5028.	2.5
PART.SCRB.INLET	5335.	480.0	---	---	---	---	0.061	118.3	---	1.4
PART.CYC.EXIT	4949.	140.0	5005.6	---	---	---	0.110	136.4	4458.	-8.1
VENT ABS.INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC.EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	4949.	140.0	---	---	---	---	0.110	136.4	---	---
FLOATING BED EX	6136.	132.0	---	---	---	---	0.106	134.2	---	-10.8
P.P. EXIT ORIF.	6136.	132.0	76.3	---	---	---	0.106	134.2	---	-16.3
									5549.	-16.3

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FRA
PARTICULATE	60.0	4.91	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	134.0	4.92	MAKEUP MCD SL.	---	60.0
PRODUCT LIQ.	134.0	23.15	PRODUCT LIQ.	---	143.0
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	---	134.0
			REC.(FLOW NOZ.)	---	134.0
				---	399.0
				---	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.552E 07	SCRUBBER PERFORMANCE	PART.	VENT ANS.	FLUAT.RED
% FUEL AS COAL	96.5	SO2 ABSORB.EFF	1.97	---	98.48
COAL FLOW RATE,#/HR	437.7	FLYASH COL.EFF	---	---	---
NAT.GAS FLOW,#/HR	8.8	SO3 ABSORB.EFF	---	---	---
% EXCESS AIR	9.5	NOX ABSORB.EFF	---	---	---
OXYGEN,% DRY, MEAS.	2.00	GAS VELOCITY,FPS	133.6	---	12.9
CO2,% DRY-CALC.	16.34	LIQ/GAS,GAL/MCF	17.5	---	33.1
HUMIDITY,#/# - CALC.	0.061	LIQ/CAS,#/#	2.3	---	4.5
		PRES.DROP,IN.WG	4.6	---	5.8

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

SULFATE FORMATION PARAMETERS

KGA,#MOLE/HR-FT2,	=	*****	CONC.,GM-MOLE/L=	0.0208
SULFITE/SO2-MCL/MOL	=	*****	MUL% TOTAL SULF=	1.97
SUMP RESID.TIME,MIN	=	*****	O2 AT FURN.EX.=	2.00
			O2 AT ABSORB.IN=	*****
			O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-164

DATE 4-29-70

TIME OF DAY 2000

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	16.19	---	---	32.39	288.2	5020.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	26.67	---	---	*****	307.1	5028.	CARBON 0.503467
PART. SCRUBBER		26.67	---	*****	2762.	5028.	HYDROGEN 0.635630
INPUT, #/HR	23.18	---	---	*****	2954.	4458.	OXYGEN 1.389954
OUTPUT, #/HR	23.18	---	---	*****	2954.	5549.	NITROGEN 5.022507
SO2 ABSORBERS		23.18	*****	*****	1142.	4458.	SULFUR 0.009572
INPUT, #/HR	31.08	21.93	*****	*****	1297.	5549.	
OUTPUT, #/HR	31.08	21.93	*****	*****	1142.	4458.	

FEED RATE, #/SEC = 1.47

ENTHALPY, BTU/# = -4114.

* SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	7.39	GM SO2/100ML	GRAM/100ML	MAKEUP MGO COMPOSITION
COMBINED	7.04			SLURRY CONC. - GM MGO/100ML = *****
FREE	0.36			MGO PRESLAKED, MG=0, YES=1 *****
MONO(TOTAL)	6.68			% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	0.72			
MONO(SOLID)	5.96			PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	0.92			ACID STRENGTH, PH = 7.30
MGO	0.0			SP.GRAVITY, HYDRON. = 1.0400
SULFATE	0.13			
MAGNESIUM	7.17			
FLYASH	---			
SOLIDS, MG	---			

PRODUCT MG BASE PHYSICAL PROPERTIES

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-165	CARD NUMBER	2	CARD NUMBER	3
DATE	4-29-70	WINDBOX ST,H2O	0.5200E 01	N.G. FLOW,%SCALE	0.9700E 02
TIME	2200	BURNER DP,H2O	0.7200E 01	N.G. STATIC,R.O.	0.8300E 01
PRI.AIR ST, HG	0.1350E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.4450E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1300E 01	02 FURN.EX,%-BM	0.2000E 01
SEC.AIR ST,HG	0.1350E 01	PP EXIT DP,H2O	0.5100E 01	COMP.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2100E 01	FURN.EX,ST,H2O	0.2000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2897E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECCORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR CRIF.	0.1300E 03	PART.SCRUB.IN	0.4300E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7550E 03	#1 URIFICE	0.1450E 03
ABS LOAD,PSIG	0.4600E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.1000E 03
ABS CRIF.INCH	0.4800E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7000E 03	PRI.AIR FAN IN.	0.9200E 02
		NO.2 BANK OUT	0.5900E 03	PRI.AIR WGT BULB	0.7400E 02
CARD NUMBER	7	FURN. EXIT	0.4300E 03	SEC.AIR FAN IN.	0.7800E 02
MODE OF OPER.	3	COAL-AIR	0.1350E 03	SEC.AIR WET BULB	0.7000E 02
PART.SCR.ST,HG	0.1000E 00	CARD NUMBER	8	CARD NUMBER	9
PART.SCR.DP,H2O	0.4600E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.8000E 00
PART.CYC.DP,H2O	0.4800E 01	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1300E 01
#1 ORIF.ST,HG	-0.6000E 00			FBA DP,H2O	0.5400E 01
#1 ORIF.DP,H2O	0.3400E 01			FBA DEMIST.DP,H2O	0.9000E 00
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.1070E 03	PART.CYC.EXIT	0.1370E 03	PART.INIT.GAL	0.2564E 05
FBA INLET	0.1370E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2600E 05
FBA EXIT	0.1290E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.6500E 02
P.P.EXIT	0.1290E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.3688E 05
PART.CYC.SUMP	0.1250E 03	FBA SUMP	0.1340E 03	ABS H2O FI,GAL	0.3694E 05
ABS CYC.SUMP	0.8500E 02	MGO SLAK TANK	0.2100E 03	ABS H2O TIME,MIN	0.6500E 02
FBA SUMP	0.1340E 03	MGOH2 TANK	0.1370E 03	MGO KOTO.SCALE,%	0.6900E 02
MGO SLAK TANK	0.2070E 03			MAKEUP SETTING	0.6900E 02
MGOH2 TANK	0.1350E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-165

DATE 4-29-70

TIME OF DAY 2200

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/%	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	480.	135.0	---	---	---	---	0.015	73.3	473.	18.3
SECONDARY AIR	4549.	733.8	---	---	---	---	0.015	74.3	4480.	5.2
FURNACE EXIT	5455.	430.0	4869.5	---	---	---	0.060	117.9	5145.	2.0
PART.SCRB.INLET	5455.	430.0	---	---	---	---	0.060	117.9	---	1.4
PART.CYC.EXIT	5050.	137.0	4729.5	---	---	---	0.101	133.5	4587.	-11.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5050.	137.0	*****	*****	*****	*****	0.101	133.5	---	-10.8
FLOATING BED EX	6165.	129.0	*****	*****	*****	*****	0.092	129.5	---	-17.6
P.P. EXIT GRIF.	6165.	129.0	67.4	*****	*****	*****	0.092	129.5	5648.	-17.6

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	60.0	5.50	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	132.0	5.09	MAKEUP MGD SL.	*****	60.0 7.4
PRODUCT LIQ.	132.0	23.15	PRODUCT LIQ.	6.4	135.0 6.9
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	134.0 19.1
			REC.(FLOW NOZ.)	*****	134.0 394.7
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.565E 07
% FUEL AS COAL	96.6
COAL FLOW RATE,#/HR	448.2
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	9.5
OXYGEN,DDRY,MEAS.	2.00
CO2,DDRY-CALC.	16.34
HUMIDITY,#/# - CALC.	0.060

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
SO2 ABSORB.EFF	2.88	*****	98.58
FLYASH COL.EFF	*****	*****	*****
SO3 ABSORB.EFF	*****	*****	*****
NOX ABSORB.EFF	*****	*****	*****
GAS VELOCITY,FPS	134.9	*****	12.8
LIQ/GAS,GAL/MCF	17.3	*****	33.2
LIQ/GAS,#/P	2.3	*****	4.4
PRES.DRUP,IN.WG	4.6	*****	5.4

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2,	=	49.5
SULFITE/SO2-MOL/MOL	=	4.83
SUMP RESID.TIME,MIN	=	13.3

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0281
MUL% TOTAL SULF=	3.32
U2 AT FURN.EX.=	2.00
U2 AT ABSORB.IN=	*****
U2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-165

DATE 4-29-70

TIME OF DAY 2200

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN.PROG.
INPUT, #/HR	16.58	-----	33.17	291.2	5136.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	26.02	-----	*****	310.1	5145.	CARBON 0.503600
PART. SCRUBBER						HYDROGEN 0.632438
INPUT, #/HR	26.02	-----	*****	3065.	5145.	UXYGEN 1.389966
OUTPUT, #/HR	22.54	-----	*****	3012.	4587.	NITROGEN 5.022376
						SULFUR 0.009579

SU2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

FEED RATE, #/SEC= 1.50
ENTHALPY, BTU/# = -3715.

*SU2 ABSORBERS-
PRODUCT COMP.

TOTAL, COMBINED FREE	GM SU2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
5.50	0.8599	-----	-----
5.25	0.8207	-----	-----
0.25	0.0392	-----	-----
5.00	0.7814	-----	-----
MONO(DISSOLVED)	0.98	0.1531	1.592
MONO(SOLID)	4.02	0.6283	13.320
BISULFITE	0.96	0.0750	1.355
MGO	0.0	0.0	0.0
SULFATE	0.18	0.0281	0.338
MAGNESIUM	5.43	0.8488	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	7.981

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGO/100ML = 9.00
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.30
SP.GRAVITY, HYDROM. = 1.0500

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME PRI.AIR ST, HG PRI.AIR DP,H2O SEC.AIR ST,HG SEC.AIR DP,H2O	L-166 4-30-70 0001 0.1400E C1 0.2300E 01 0.1400E C1 0.2100E 01	CARD NUMBER WINDBOX ST,H2O BURNER DP,H2O FURN. ST,H2O PP EXIT ST,HG PP EXIT DP,H2O FURN.EX.ST,H2O PEEPSITE DP,HG P.SITE ST,PSIG	2 0.7500E 01 0.5200E 01 0.2600E 01 -.1300E 01 0.5100E 01 0.2600E 01 0.0 0.0	CARD NUMBER N.G. FLOW,%SCALE N.G. STATIC,R.D. SCREW SPEED,RPM O2 FURN.EX.%-BM CCMB.FURN,EX.% ELE.CHEM.NILVOLT CELL TEMP,F BAROMETRIC,HG	3 0.9700E 02 0.8400E 01 0.4400E 03 0.2400E 01 0.0 0.0 0.0 0.2897E 02
CARD NUMBER PART.NOZ.,PSIG PART.LOAD,PSIG ABS NOZ.,PSIG ABS LOAD,PSIG ABS ORIF,INCH ABSORBER NOZ. CODE MANOMETER CODE	4 0.4000E 02 0.4200E 02 0.2650E C2 0.4800E 02 0.4800E 01 1 0	CARD NUMBER TEMP.FURN.RECORDER,F SEC.AIR ORIF. WINDBOX-TCP WINDBOX-WEST WINDBOX-BOT. WINDBOX-EAST NO.1 BANK OUT NO.2 BANK OUT FURN. EXIT COAL-AIR	5 0.1250E 03 0.7550E 03 0.7200E 03 0.7200E 03 0.7450E 03 0.7300E 03 0.6200E 03 0.4400E 03 0.1300E 03	CARD NUMBER TEMP.CONTINUED PART.SCRUB.IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI.AIR FAN IN. PRI.AIR WGT BULB SEC.AIR FAN IN. SEC.AIR WET BULB	6 0.4500E 03 0.1450E 03 0.1000E 03 0.8500E 03 0.8500E 03 0.9000E 02 0.7300E 02 0.7200E 02 0.6500E 02
CARD NUMBER MCDE OF UPER. PART.SCR.ST,HG PART.SCR.DP,H2O PART.CYC.DP,H2O #1 ORIF.ST,HG #1 ORIF.DP,H2O	7 3 0.1000E 00 0.4700E 01 0.5000E 01 -.6000E 00 0.3300E 01	CARD NUMBER VENT.ABS.DP,H2O ABS CYC.DP,H2O	8 0.0 0.0	CARD NUMBER FBA INLET ST,HG FBA SUMP DP,H2O FBA DP,H2O FBA DEMIST.DP,H2O	9 -.8000E 00 0.1400E 01 0.5600E 01 0.1000E 01
CARD NUMBER TEMP.PILOT RECORDER,F #1 ORIFICE FBA INLET FBA EXIT P.P.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 0.1070E 03 0.1370E 03 0.1300E 03 0.1300E 03 0.1260E 03 0.8500E 02 0.1340E 03 0.1970E 03 0.1250E 03 C.6000E 02	CARD NUMBER TEMP.THERMOMETERS,F PART.CYC.EXIT ABS CYC.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 0.1370E 03 0.0 0.1330E 03 0.0 0.1340E 03 C.1960E 03 0.1300E 03	CARD NUMBER MAKEUP FLOWS PART.INIT.GAL PART.FINAL,GAL PART.TIME,MIN ABS H2O IN.GAL ABS H2O FI.GAL ABS H2O TIME,MIN MGO ROTO.SCALE,% MAKEUP SETTING	12 0.2631E 05 0.2674E 05 0.7600E 02 0.3702E 05 0.3709E 05 0.7600E 02 0.6300E 02 0.6300E 02

RUN NUMBER L-166

DATE 4-30-70

TIME OF DAY 0001

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SU2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRFS IN. H2O
PRIMARY AIR	483.	130.0	---	---	---	---	0.014	72.5	476.	19.0
SECONDARY AIR	4575.	735.0	---	---	---	---	0.013	69.2	4517.	7.5
FURNACE EXIT	5478.	440.0	***	***	***	***	0.057	116.2	5182.	2.6
PART.SCRB.INLET	5478.	450.0	***	***	***	***	0.057	116.2	---	1.4
PART.CYC.EXIT	4969.	137.0	***	***	***	***	0.103	134.2	4505.	-8.1
VENT ABS.INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC.EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	4969.	137.0	***	***	***	***	0.103	134.2	---	***
FLOATING BED EX	6155.	130.0	***	***	***	***	0.093	129.8	---	-10.8
P.P. EXIT DRIF.	6155.	130.0	***	***	***	***	0.093	129.8	---	-17.6
			74.0						5633.	-17.6

SCRUBBER STREAM DATA

ARTICULATE	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FDA
MAKEUP WATER	60.0	5.72	MAKEUP WATER	TEMP, F	TEMP, F
PRODUCT LIQ.	133.0	5.09	MAKEUP MGO SL.	FLOW, #/M	FLOW, #/M
RECIRCULATED LIQ.	133.0	23.15	PRODUCT LIQ.	***	8.4
			REC. (SPRAY NOZ.)	6.4	6.5
			REC. (FLOW NOZ.)	***	18.1
				***	390.4
				***	455.7

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.558E 07
% FUEL AS COAL	96.5
COAL FLOW RATE, #/HR	442.3
NAT. GAS FLOW, #/HR	8.8
% EXCESS AIR	11.4
OXYGEN, % DRY, MEAS.	2.40
CO2, % DRY-CALC.	15.99
HUMIDITY, #/# - CALC.	0.057

SCRUBBER PERFORMANCE	PART.
SO2 ABSORB.EFF	2.19
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	133.0
LIQ/GAS,GAL/MCF	17.5
LIQ/GAS,#/#	2.3
PRES.DROP,IN.WG	4.7

FLOAT BED

98.	34
**	**
**	**
**	**
**	**
**	**

12.	9
**	**
**	**
**	**
**	**
**	**

33.	2
**	**
**	**
**	**
**	**
**	**

4.	4
**	**
**	**
**	**
**	**
**	**

5.	6
**	**
**	**
**	**
**	**
**	**

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2,	*****		KGA, #MOLE/HR-FT2	=	47.7
SULFITE/SO2-MOL/MOL	*****		SULFITE/SO2-MOL/MOL	=	5.23
SUMP RESID.TIME, MIN	*****		SUMP RESID.TIME, MIN	=	14.7

***** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L=	0.0378
MOL% TOTAL SULF=	3.66
02 AT FURN. EX.=	2.40
02 AT ABSORB. IN=	☆☆☆☆☆
02 AT ABSORB. EX=	☆☆☆☆☆

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-166

DATE 4-30-70

TIME OF DAY 0001

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

SULFUR
16.36
24.60

MAGNESIUM

FLYASH
32.73

WATER
277.7
296.6

DRY GAS
5173.
5182.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

24.60
20.92

3159.
3013.

5182.
4505.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

20.92
39.81

21.03
27.61

1325.
1479.

4505.
5633.

*

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGC COMPOSITION

SLURRY CONC.- GM MGO/100ML = 9.00
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

7.01
6.53
0.48
6.05
1.00
5.05
0.80
0.0
0.24
6.77

1.0957
1.0203
0.0753
0.9450
0.1562
0.7888
0.0625
0.0
0.0378
1.0582

1.625
16.722
1.163
0.0
0.454

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.20
SP.GRAVITY, HYDROM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.494033
HYDROGEN 0.619511
OXYGEN 1.391089
NITROGEN 5.031182
SULFUR 0.009395

FEED RATE, #/SEC= 1.51

ENTHALPY, BTU/# = -2335.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-167	CARD NUMBER	2	CARD NUMBER	3
DATE	4-30-7C	WINDBOX ST,H2O	0.7600E 01	N.G. FLOW, %SCALE	0.9700E 02
TIME	0400	BURNER DP,H2O	0.5200E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2600E 01	SCREW SPEED,RPM	0.4500E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1300E 01	O2 FURN.EX,%-GM	0.2100E 01
SEC.AIR ST,HG	0.1300E 01	PP EXIT DP,H2O	0.5000E 01	CCMB.FURN.EX,%	0.0
SEC.AIR DP,H2O	0.2000E 01	FURN.EX.ST,H2O	0.2600E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2895E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NUZ.,PSIG	0.4000E 02	TEMP.FURN.RECURDER,F	0.1250E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR CRIF.	0.7500E 03	PART.SCRUB.IN	0.4300E 03
ABS NUZ.,PSIG	0.2600E 02	WINDBOX-TOP	0.7200E 03	#1 CRIFICE	0.1400E 03
ABS LOAD,PSIG	0.4800E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.9000E 02
ABS CRIF.INCH	0.5300E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NUZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6800E 03	PRI.AIR FAN IN.	0.8800E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MCDE CF OPER.		VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.8500E 00
PART.SCR.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.7000E 00
PART.SCR.DP,H2O	0.4900E 01			FBA DP,H2O	0.6000E 01
PART.CYC.DP,H2O	0.5000E 01			FBA DEMIST.DP,H2O	0.9000E 00
#1 CRIF.ST,HG	-0.6000E 00				
#1 CRIF.DP,H2O	0.3300E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 CRIFICE	0.1040E 03	PART.CYC.EXIT	0.1360E 03	PART.INIT.GAL	0.2769E 05
FBA INLET	0.1360E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.2803E 05
FBA EXIT	0.1280E 03	PART.CYC.SUMP	0.1320E 03	PART.TIME,MIN	0.7500E 02
P.P.EXIT	0.1280E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.3733E 05
PART.CYC.SUMP	0.1250E 03	FBA SUMP	0.1340E 03	ABS H2O FI.GAL	0.3742E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1020E 03	ABS H2O TIME,MIN	0.7500E 02
FBA SUMP	0.1340E 03	MGOH2 TANK	0.1500E 03	MGO RUTU.SCALE,%	0.7200E 02
MGO SLAK TANK	0.9800E 02			MAKEUP SETTING	0.7200E 02
MGOH2 TANK	0.1450E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-167

DATE 4-30-70

TIME OF DAY 0400

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	496.	120.0	---	---	---	---	0.014	71.7	490.	17.6
SECONDARY AIR	4456.	732.5	---	---	---	---	0.013	69.1	4399.	7.6
FURNACE EXIT	5371.	420.0	4528.3	---	---	---	0.058	116.6	5077.	2.6
PART.SCRB.INLET	5371.	430.0	---	---	---	---	0.058	116.6	---	1.4
PART.CYC.EXIT	4988.	136.0	4413.2	---	---	---	0.093	130.9	4564.	-5.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	4988.	136.0	*****	*****	*****	*****	0.093	130.9	---	-11.5
FLOATING BED EX	6114.	128.0	*****	*****	*****	*****	0.088	128.0	---	-17.6
P.P. EXIT GRIF.	6114.	128.0	70.2	*****	*****	*****	0.088	128.0	5621.	-17.6

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	4.52	---	*****	60.0
MAKEUP WATER	132.0	5.09	---	*****	145.0
PRODUCT LIQ.	132.0	23.15	---	*****	134.0
RECIRCULATED LIQ.	---	---	---	*****	134.0
	---	---	---	*****	386.0
	---	---	---	*****	478.9

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.555E 07
% FUEL AS COAL	96.5
COAL FLOW RATE,#/HR	439.8
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	10.0
OXYGEN,DRY,MEAS.	2.10
CO2,DRY-CALC.	16.25
HUMIDITY,#/# - CALC.	0.058

SC2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	*****
SULFITE/SC2-MUL/MUL	*****
SUMP RESID.TIME,MIN	*****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	2.54
FLYASH CUL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	132.6
LIQ/GAS,GAL/MCF	17.6
LIQ/GAS,#/#	2.3
PRES.DROP,IN.WG	4.9

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	48.0
SULFITE/SO2-MUL/MUL	6.25
SUMP RESID.TIME,MIN	12.4

VENT ABS.

VENT ABS.	*****
*****	98.41
*****	*****
*****	*****
*****	*****
*****	12.7
*****	35.3
*****	4.7
*****	6.0

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L	0.0277
MOL% TOTAL SULF	3.79
O2 AT FURN.EX.	2.10
O2 AT ABSORB.IN	*****
O2 AT ABSORB.EX	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	L-168 4-30-70 0600	CARD NUMBER WINDBOX ST,H2O BURNER DP,H2O FURN. ST,H2O PP EXIT ST,HG PP EXIT DP,H2O FURN.EX.ST,H2O PEEPSITE DP,HG P.SITE ST,PSIG	2 01 01 01 01 01 01 0.0 0.0	CARD NUMBER N.G. FLOW,%SCALE N.G. STATIC,K.O. SCREW SPEED,RPM D2 FURN.EX.%-DM CCHD.FURN,EX.% ELE.CHEM.MILVULT CELL TEMP,F BAROMETRIC,HG	3 02 01 03 01 0.0 0.0 0.0 0.2895E 02
CARD NUMBER PART.NOZ.,PSIG PART.LOAD,PSIG ABS NOZ.,PSIG ABS LOAD,PSIG ABS ORIF.,INCH ABSORBER NOZ. CODE MANOMETER CODE	4 02 02 02 02 01 1 0	CARD NUMBER TEMP.FURN.RECORDER,F SFC.AIR ORIF. WINDBOX-TOP WINDBOX-WEST WINDBOX-BOT. WINDBOX-EAST NO.1 BANK OUT NO.2 BANK OUT FURN. EXIT COAL-AIR	5 03 03 03 03 03 03 03 03 03 03	CARD NUMBER TEMP.CONTINUED PART.SCRUB.IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI.AIR FAN IN. PRI.AIR WGT BULB SEC.AIR FAN IN. SEC.AIR NET BULB	6 03 03 02 03 03 02 02 02 02 02
CARD NUMBER MODE OF OPER. PART.SCR.ST,HG PART.SCR.OP,H2O PART.CYC.OP,H2O #1 ORIF.ST,HG #1 ORIF.OP,H2O	7 3 00 01 00 01	CARD NUMBER VENT.ABS.DP,H2O ABS CYC.DP,H2O	8 0.0 0.0	CARD NUMBER FBA INLET ST,HG FBA SUMP DP,H2O FBA DP,H2O FBA DEMIST.DP,H2O	9 00 00 01 00
CARD NUMBER TEMP.PILOT RECORDER,F #1 ORIFICE FBA INLET FBA EXIT P.P.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 03 03 03 03 03 02 03 03 03 03	CARD NUMBER TEMP.THERMOMETERS,F PART.CYC.EXIT ABS CYC.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 03 0.0 03 0.0 03 03	CARD NUMBER MAKEUP FLOWS PART.INIT.GAL PART.FINAL,GAL PART.TIME,MIN ABS H2O IN,GAL ABS H2O FI,GAL ABS H2O TIME,MIN MGO ROTO.SCALE,% MAKEUP SETTING	12 05 05 02 05 05 02 02 02 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER L-168

DATE 4-30-70

TIME OF DAY 0600

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	497.	120.0	---	---	---	---	0.014	72.1	490.	19.0
SECONDARY AIR	4585.	732.5	---	---	---	---	0.014	70.7	4523.	7.3
FURNACE EXIT	5493.	430.0	4598.9	---	---	---	0.057	115.8	5198.	1.8
PART.SCRUB.INLET	5493.	450.0	---	---	---	---	0.057	115.8	---	1.4
PART.CYC.EXIT	4960.	137.0	4458.5	---	---	---	0.099	132.8	4512.	-9.5
VENT ABS.INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC.EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	4560.	137.0	---	---	---	---	0.099	132.8	---	-10.8
FLOATING BED EX	6101.	128.0	---	---	---	---	0.091	129.1	---	-17.6
P.P. EXIT ORIF.	6101.	128.0	72.3	---	---	---	0.091	129.1	5593.	-17.6

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FBA TEMP,F FLOW,#/M
PARTICULATE	60.0	4.67	---	---	---
MAKEUP WATER	133.0	4.92	---	---	---
PRODUCT LIQ.	133.0	23.15	---	---	---
RECIRCULATED LIQ.	---	---	---	---	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.545E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	432.1
NAT.GAS FLOW,#/HR	8.8
% EXCESS AIR	13.8
OXYGEN,% DRY, MEAS.	2.90
CO2,% DRY-CALC.	15.56
HUMIDITY,#/# - CALC.	0.057

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	3.05
FLYASH COL.EFF	---
SO3 ABSORB.EFF	---
NOX ABSORB.EFF	---
GAS VELOCITY,FPS	133.3
LIQ/GAS,GAL/MCF	17.5
LIQ/GAS,#/#	2.3
PRES.DROP,IN.WG	4.7

VENT ABS.

FLOAT.BED	98.38
---	---
---	---
---	---
---	---
---	12.7
---	33.5
---	4.5
---	6.0

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****

SULFITE/SC2-MOL/MOL = *****

SUMP RESID.TIME,MIN = *****

***** MEANS ILM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 47.7

SULFITE/SC2-MOL/MOL = *****

SUMP RESID.TIME,MIN = 12.7

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L = *****

MUL% TOTAL SULF = 3.79

O2 AT FURN.EX. = 2.90

O2 AT ABSORB.IN = *****

O2 AT ABSORB.EX = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-168

DATE 4-30-7C

TIME OF DAY 0600

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FLOWS, #ATOMS/100#FEED
INPUT, #/HR	15.99	-----	31.98	276.2	5190.	CARBON 0.481986
OUTPUT, #/HR	24.91	-----	*****	295.1	5198.	HYDROGEN 0.607222
						OXYGEN 1.392500
PART. SCRUBBER						NITROGEN 5.042274
INPUT, #/HR	24.91	-----	*****	2633.	5198.	SULFUR 0.009161
OUTPUT, #/HR	20.96	-----	*****	2910.	4512.	

FEED RATE, #/SEC= 1.52

ENTHALPY, BTU/# = -2477.

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

20.95

0.0

1425.
1593.

4512.
5553.

*
*SO2 ABSORBERS-
PRODUCT CLMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****
MGO PRESLAKED, NU=0, YFS=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = *****
SP.GRAVITY, HYDRUM. = *****

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-169	CARD NUMBER	2	CARD NUMBER	3
DATE	4-30-76	WINDBOX ST, H2O	0.7500E 01	N.G. FLOW, %SCALE	0.9900E 02
TIME	1030	BURNER DP, H2O	0.5000E 01	N.G. STATIC, R.O.	0.9400E 01
PRI. AIR ST, HG	0.1400E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1400E 01	O2 FURN. EX. % - BM	0.2000E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5000E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2000E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2898E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1300E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.7500E 03	PART. SCRUB. IN	0.4400E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7200E 03	#1 ORIFICE	0.1500E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.1500E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7300E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.7500E 03	PRI. AIR FAN IN.	0.9500E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.6200E 03	PRI. AIR WGT BULB	0.7600E 02
MODE OF OPER.	3	FURN. EXIT	0.4200E 03	SEC. AIR FAN IN.	0.8000E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR	0.1400E 03	SEC. AIR WGT BULB	0.7000E 02
PART. SCR. DP, H2O	0.5600E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5200E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.8000E 00
#1 ORIF. ST, HG	-0.6000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.6000E 00
#1 ORIF. DP, H2O	0.3400E 01	CARD NUMBER	11	FBA DP, H2O	0.6200E 01
CARD NUMBER	10	TEMP. THERMOMETERS, F	0.1350E 03	FBA DENIST. DP, H2O	0.1000E 01
TEMP. PILOT RECORDER, F	0.1050E 03	PART. CYC. EXIT	0.0	CARD NUMBER	12
FBA INLET	0.1350E 03	ABS CYC. EXIT	0.0	MAKEUP FLOWS	
FBA EXIT	0.1300E 03	PART. CYC. SUMP	0.1340E 03	PART. INIT. GAL	0.2987E 05
P.P. EXIT	0.1300E 03	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.3023E 05
PART. CYC. SUMP	0.1260E 03	FBA SUMP	0.1250E 03	PART. TIME, MIN	0.7500E 02
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O IN. GAL	0.3789E 05
FBA SUMP	0.1250E 03	MGOH2 TANK	0.1400E 03	ABS H2O FI. GAL	0.3796E 05
MGO SLAK TANK	0.1540E 03			ABS H2O TIME, MIN	0.7500E 02
MGOH2 TANK	0.1380E 03			MGO ROTU. SCALE, %	0.6900E 02
MAKEUP WATER	0.6200E 02			MAKEUP SETTING	0.6900E 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE

RUN NUMBER L-169

DATE 4-30-70

TIME OF DAY 1030

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	489.	140.0	---	---	---	---	0.016	75.4	481.	19.0
SECONDARY AIR	4429.	730.0	---	---	---	---	0.015	73.4	4364.	7.5
FURNACE EXIT	5335.	420.0	4480.3	8.7	412.	---	0.060	117.8	5032.	2.2
PART.SCRB.INLET	5335.	440.0	*****	*****	*****	*****	0.060	117.8	---	2.7
PART.CYC.EXIT	5062.	135.0	4556.4	*****	523.	*****	0.099	132.8	4608.	-8.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5062.	135.0	*****	*****	*****	*****	0.099	132.8	---	-10.8
FLOATING BED EX	6081.	130.0	*****	*****	*****	*****	0.097	131.1	---	-19.0
P.P. EXIT ORIF.	6081.	130.0	59.7	*****	717.	*****	0.097	131.1	5546.	-19.0

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FRA
PARTICULATE				TEMP,F	TEMP,F
MAKEUP WATER	62.0	4.71	MAKEUP WATER	FLOW,#/M	FLOW,#/M
PRODUCT LIQ.	134.0	5.09	MAKEUP LIG SL.	*****	7.6
RECIRCULATED LIQ.	134.0	23.15	PRODUCT LIQ.	6.4	6.9
			REC.(SPRAY NOZ.)	*****	14.3
			REC.(FLOW NOZ.)	*****	394.7
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.553E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	437.7
NAT.GAS FLOW,#/HR	9.0
% EXCESS AIR	9.5
OXYGEN,% DRY, MEAS.	2.00
CO2, DRY-CALC.	16.33
HUMIDITY,#/# - CALC.	0.060

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	-1.70
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	-27.05
GAS VELOCITY,FPS	134.6
LIQ/GAS,GAL/MCF	17.3
LIQ/GAS,#/#	2.3
PRES.DROP,IN.WG	5.6

VENT ABS.

*****	FLOAT.BED
*****	98.69
*****	*****
*****	*****
*****	-37.08
*****	12.8
*****	33.4
*****	4.5
*****	6.2

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, % MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****
*****	MEANS	ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA, % MOLE/HR-FT2	=	49.6
SULFITE/SO2-MOL/MOL	=	5.01
SUMP RESID.TIME,MIN	=	20.3

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L=	0.0270
MOL% TOTAL SULF=	3.36
O2 AT FURN.EX=	2.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-169

DATE 4-30-70

TIME OF DAY 1030

MATERIAL BALANCES

FURNACE
INPUT, #/HR 16.20
OUTPUT, #/HR 23.42

PART. SCRUBBER
INPUT, #/HR 23.42
OUTPUT, #/HR 21.81

SO2 ABSORBERS
INPUT, #/HR 21.81
OUTPUT, #/HR 23.62

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 5.25
COMBINED 5.21
FREE 0.04
MONO(TOTAL) 5.17
MONO(DISSOLVED) 0.96
MONO(SOLID) 4.21
BISULFITE 0.28
MGD 0.0
SULFATE 0.17
MAGNESIUM 5.38
FLYASH
SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR
MAGNESIUM
FLYASH
WATER
DRY GAS

16.20
23.42
23.42
2661.
5032.

21.81
23.62
23.62
3003.
4608.

21.81
23.62
23.62
1295.
4608.

21.81
23.62
23.62
1313.
5546.

5.25
5.21
0.04
5.17
0.96
4.21
0.28
0.0
0.17
5.38

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100 FEED
CARBON 0.503317
HYDROGEN 0.044137
OXYGEN 1.388940
NITROGEN 5.022653
SULFUR 0.009564

FEED RATE, #/SEC = 1.47

ENTHALPY, BTU/# = -3721.

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = 7.80
MGD PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.70
SP. GRAVITY, HYDROM. = 1.0650

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-170	CARD NUMBER	2	CARD NUMBER	3
DATE	4-30-76	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, %SCALF	0.9900E 02
TIME	1200	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.U.	0.9400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1000E 01	SCREW SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1600E 01	O2 FURN. EX. % - BM	0.2000E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.1200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2898E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1400E 03	PART. SCRUB. IN	0.4200E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX - TCP	0.7500E 03	#1 ORIFICE	0.1600E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX - WEST	0.7300E 03	FBA INLET	0.1600E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX - DOT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX - EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.7600E 03	PRI. AIR FAN IN.	0.9800E 02
		NO. 2 BANK OUT	0.6700E 03	PRI. AIR WGT BULB	0.7200E 02
CARD NUMBER	7	FURN. EXIT	0.4400E 03	SEC. AIR FAN IN.	0.8200E 02
MODE OF OPER.	3	CUAL - AIR	0.1380E 03	SFC. AIR WET BULB	0.7000E 02
PART. SCR. ST, HG	0.2000E 00				
PART. SCR. DP, H2O	0.6200E 01				
PART. CYC. DP, H2O	0.6000E 01				
#1 ORIF. ST, HG	-0.9000E 00				
#1 ORIF. DP, H2O	0.4000E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 01
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1200E 01
		FBA DP, H2O	0.8200E 01
		FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1080E 03	PART. CYC. EXIT	0.1380E 03	PART. INIT. GAL	0.2987E 05
FBA INLET	0.1380E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.3023E 05
FBA EXIT	0.1320E 03	PART. CYC. SUMP	0.1360E 03	PART. TIME, MIN	0.7500E 02
P. P. EXIT	0.1320E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.7887E 04
PART. CYC. SUMP	0.1300E 03	FBA SUMP	0.1350E 03	ABS H2O FI. GAL	0.7956E 04
ABS CYC. SUMP	0.9200E 02	MGO SLAK TANK	0.1600E 03	ABS H2O TIME, MIN	0.7500E 02
FBA SUMP	0.1350E 03	MGOH2 TANK	0.1350E 03	MGO ROTO. SCALE, %	0.8100E 02
MGO SLAK TANK	0.1800E 03			MAKEUP SETTING	0.8100E 02
MGOH2 TANK	0.1300E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER	L-170	DATE	4-30-70	TIME OF DAY	1200										
FLUE GAS DATA						FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NCX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR						478.	138.0	---	---	---	---	0.012	67.2	473.	16.3
SECONDARY AIR						4607.	740.0	---	---	---	---	0.015	72.5	4541.	6.0
FURNACE EXIT						5517.	440.0	4508.9	*****	*****	*****	0.059	117.3	5208.	1.2
PART. SCRUB. INLET						5517.	420.0	*****	*****	*****	*****	0.059	117.3	----	2.7
PART. CYC. EXIT						5457.	138.0	4442.9	*****	*****	*****	0.093	130.4	4994.	-12.2
VENT. ABS. INLET						*****	*****	*****	*****	*****	*****	*****	*****	----	*****
ABS. CYC. EXIT						*****	*****	*****	*****	*****	*****	*****	*****	----	*****
FLOATING BED IN						5457.	138.0	*****	*****	*****	*****	0.093	130.4	----	-13.5
FLOATING BED EX						6241.	132.0	*****	*****	*****	*****	0.089	128.1	----	-21.7
P.P. EXIT DRIF.						6241.	132.0	42.5	*****	*****	*****	0.089	128.1	5732.	-21.7

SCRUBBER STREAM DATA

PARTICULATE	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
MAKEUP WATER	62.0	4.71	MAKEUP WATER	TEMP, F	FLOW, #/M
PRODUCT LIQ.	136.0	5.09	MAKEUP MGD SL.	*****	7.6
RECIRCULATED LIQ.	136.0	23.15	PRODUCT LIQ.	6.4	7.8
			REC. (SPRAY NOZ.)	*****	15.7
			REC. (FLOW NOZ.)	*****	386.0
				*****	455.7

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.572E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT. BLD
% FUEL AS COAL	96.5	SO2 ABSORB. EFF	1.47	*****	99.04
COAL FLOW RATE, #/HR	453.5	FLYASH COL. EFF	*****	*****	*****
NAT. GAS FLOW, #/HR	9.0	SO3 ABSORB. EFF	*****	*****	*****
% EXCESS AIR	9.5	NCX ABSORB. EFF	*****	*****	*****
OXYGEN, % DRY, MEAS.	2.00	GAS VELOCITY, FPS	146.9	*****	13.2
CO2, % DRY-CALC.	16.34	LIQ/GAS, GAL/MCF	15.9	*****	32.4
HUMIDITY, #/# - CALC.	0.059	LIQ/GAS, #/#	2.1	*****	4.4
		PRES. DROP, IN. WG	6.2	*****	8.2

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	*****	KGA, #MOLE/HR-FT2	=	54.9
SULFITE/SO2-MOL/MOL	*****	SULFITE/SO2-MOL/MOL	=	4.97
SUMP RESID. TIME, MIN	*****	SUMP RESID. TIME, MIN	=	19.3

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0231
MOL% TOTAL SULF=	2.87
O2 AT FURN. EX.=	2.00
O2 AT ABSORB. IN=	*****
O2 AT ABSORB. EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-170 DATE 4-30-70 TIME OF DAY 1200

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 16.78
 OUTPUT, #/HR 24.39
 PART. SCRUBBER
 INPUT, #/HR 24.39
 OUTPUT, #/HR 23.05

SO2 ABSORBERS

INPUT, #/HR 23.05
 OUTPUT, #/HR 26.02

* SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 5.33
 COMBINED 4.91
 FREE 0.43
 MONO(TOTAL) 4.48
 MONO(DISSOLVED) 0.96
 MONO(SOLID) 3.52
 BISULFITE 0.60
 MGU 0.0
 SULFATE 0.15
 MAGNESIUM 5.05
 FLYASH -----
 SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS
 INPUT, #/HR 16.78
 OUTPUT, #/HR 24.39
 PART. SCRUBBER
 INPUT, #/HR 24.39
 OUTPUT, #/HR 23.05

GM SO2/ 100ML
 5.33
 4.91
 0.43
 4.48
 0.96
 3.52
 0.60
 0.0
 0.15
 5.05

GM-MOLE/ LITER
 0.8334
 0.7667
 0.0667
 0.7001
 0.1500
 0.5501
 0.0469
 0.0
 0.0231
 0.7898

GRAM/ 100ML

 1.560
 11.661
 0.872
 0.0
 0.277

MAKEUP MGU COMPOSITION
 SLURRY CONC.- GM MGU/100ML =
 MGU PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 8.20
 SP.GRAVITY, HYDROM. = 1.0620

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH =
 FLYASH CONC. GM/100ML =

INPUT FOR EQ. - KIN. PROG.
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.503526
 HYDROGEN 0.604665
 OXYGEN 1.389959
 NITROGEN 5.022449
 SULFUR 0.009575

FEED RATE, #/SEC = 1.52

ENTHALPY, BTU/# = -3036.

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-171	CARD NUMBER	2	CARD NUMBER	3
DATE	4-30-70	WINDBOX ST, H2O	0.7000E 01	N.G. FLOW, %SCALE	0.9900E 02
TIME	1400	BURNER DP, H2O	0.5000E 01	N.G. STATIC, R.C.	0.9600E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2200E 01	SCREEN SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1800E 01	O2 FURN. EX. % - BM	0.3000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5000E 01	COMP. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.2600E 01	ELE. CHEM. FILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P-SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2890E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1400E 03	PART. SCRUB. IN	0.4700E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 GRIFICE	0.1700E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7500E 03	FBA INLET	0.1700E 03
ABS ORIF. INCH	0.4600F 01	WINDBOX-BUT.	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7600E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.7800E 03	PRI. AIR FAN IN.	0.9900E 02
		NO.2 BANK OUT	0.6700E 03	PRI. AIR WGT BULB	0.7800E 02
CARD NUMBER	7	FURN. EXIT	0.4800E 03	SEC. AIR FAN IN.	0.8400E 02
MODE OF OPER.	3	COAL-AIR	0.1400E 03	SEC. AIR WGT BULB	0.7000E 02
PART. SCR. ST, HG	0.1000E 00				
PART. SCR. DP, H2O	0.6000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.6000E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1100E 01
#1 ORIF. ST, HG	-0.1000E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1400E 01
#1 ORIF. DP, H2O	0.4000E 01			FBA DP, H2O	0.8600E 01
				FBA DENIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 GRIFICE	0.1400E 03	PART. CYC. EXIT	0.1400E 03	PART. INIT. GAL	0.0
FBA INLET	0.1400E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.3535E 03
FBA EXIT	0.1380E 03	PART. CYC. SUMP	0.1350E 03	PART. TIME, MIN	0.7500E 02
P.P. EXIT	0.1380E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.0
PART. CYC. SUMP	0.1350E 03	FBA SUMP	0.1350E 03	ABS H2O FI. GAL	0.6900E 02
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.7500E 02
FBA SUMP	0.1350E 03	MGOH2 TANK	0.1600E 03	MGO ROTO. SCALE, %	0.5000E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.5000E 02
MGOH2 TANK	0.1600E 03				
MAKEUP WATER	0.6200E 02				

RUN NUMBER L-171

DATE 4-30-70

TIME OF DAY 1400

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/H	DEW POINT F	DRY FLCW #/HR	STAT PRES IN. H2O
PRIMARY AIR	486.	140.0	---	---	---	---	0.017	77.2	478.	16.3
SECONDARY AIR	4617.	755.0	---	---	---	---	0.014	71.9	4552.	7.0
FURNACE EXIT	5514.	480.0	4357.6	***	***	***	0.057	116.1	5214.	2.6
PART. SCRB. INLET	5514.	470.0	***	***	***	***	0.057	116.1	---	1.4
PART. CYC. EXIT	5403.	140.0	4131.0	***	***	***	0.102	133.3	4906.	-13.5
VENT ABS. INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC. EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	5408.	140.0	***	***	***	***	0.102	133.3	---	-14.9
FLOATING BED EX	5979.	138.0	***	***	***	***	0.096	130.1	---	-24.4
P.P. EXIT DRIF.	5979.	138.0	33.9	***	***	***	0.096	130.1	5455.	-24.4

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FBA
PARTICULATE	TEMP, F	TEMP, F	FLOW, #/N	FLOW, #/N
MAKEUP WATER	62.0	***	***	7.7
PRODUCT LIQ.	135.0	***	6.4	5.5
RECIRCULATED LIQ.	135.0	***	***	15.7
		***	***	394.7
		***	***	446.1

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.544E C7
% FUEL AS COAL	96.3
COAL FLOW RATE, #/HR	430.9
NAT. GAS FLOW, #/HR	9.0
% EXCESS AIR	14.3
OXYGEN, % DRY, MEAS.	3.00
CO2, % DRY-CALC.	15.47
HUMIDITY, #/# - CALC.	0.057

SCRUBBER PERFORMANCE

SCRUBBER PERFORMANCE		PART.
S02 ABSORB.EFF	5.20	*****
FLYASH COL.EFF		*****
S03 ABSORB.EFF		*****
NOX ABSORB.EFF		*****
GAS VELOCITY,FPS	148.2	
LIQ/GAS,CAL/MCF	15.7	
LIQ/GAS,#/F	2.1	
PRES.DROP,IN.WG	6.0	

FLOAT. BLD

FLOAT-BED
 99.18
 13.0
 32.2
 4.5
 8.6

SC2 ABSORPTION PARAMETERS

VENTURI ABSURBER

FLUATING BED ADSORBER

SULFATE FORMATION PARAMETERS

[illegible]

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-171

DATE 4-30-70

TIME OF DAY 1400

MATERIAL BALANCES

FURNACE
INPUT, #/HR 15.94
OUTPUT, #/HR 23.68

PART. SCRUBBER
INPUT, #/HR 23.68
OUTPUT, #/HR 21.13

SO2 ABSORBERS
INPUT, #/HR 21.13
OUTPUT, #/HR 24.50

* SO2 ABSORBERS- PRODUCT COMP.

TOTAL, 5.01
COMBINED 4.90
FREE 0.11
MONO(TOTAL) 4.79
MONO(DISSOLVED) 1.04
MONO(SOLID) 3.75
BISULFITE 0.08
MGO 0.0
SULFATE 0.17
MAGNESIUM 5.06
FLYASH -----
SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS
15.94 ----- 31.89 279.7 5207.
23.68 ----- ***** 299.1 5214.
23.68 -----
21.13 ----- ***** 2658. 5214.
21.13 ----- ***** 3051. 4906.
21.13 20.70 ***** 1260. 4906.
24.50 17.88 ***** 1385. 5455.

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.479437
HYDROGEN 0.634181
OXYGEN 1.392773
NITROGEN 5.044626
SULFUR 0.009108

FEED RATE, #/SEC= 1.52

ENTHALPY, BTU/# = -2191.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 10.40
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, REAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 8.50
SP. GRAVITY, HYDROCN. = 1.0800

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

*
* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-172	CARD NUMBER	3
DATE	4-30-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	1530	N.G. STATIC, R.O.	C.9600E 01
PRI. AIR ST, HG	C.1200E 01	SCREEN SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2600E 01	O2 FURN. EX. % - BM	C.4000E 01
SEC. AIR ST, HG	0.1400E 01	COBB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	ELE. CHEN. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	C.2901E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1400E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	C.4200E 02	SEC. AIR ORIF.	C.7500E 03	PART. SCRUB. IN	0.4400E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX-TOP	C.7200E 03	#1 ORIFICE	0.1400E 03
ABS LOAD, PSIG	C.5000E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.1400E 03
ABS ORIF. INCH	0.4600E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	C.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	C.8500E 03
MANOMETER CODE	0	NO.1 BANK DUT	0.8000E 03	PRI. AIR FAN IN.	0.9900E 02
		NO.2 BANK DUT	C.7000E 03	PRI. AIR FAN HULH	0.7600E 02
CARD NUMBER	7	FURN. EXIT	0.4600E 03	SEC. AIR FAN IN.	C.8300E 02
MODE OF OPER.	3	COAL-AIR	C.1400E 03	SEC. AIR WET BULB	0.7200E 02
PART. SCR. ST, HG	0.1000E 00				
PART. SCR. DP, H2O	C.6200E 01				
PART. CYC. DP, H2O	0.6100E 01				
#1 ORIF. ST, HG	-0.1200E 01				
#1 ORIF. DP, H2O	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1100E 01
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	C.1400E 01
		FBA DP, H2O	0.8600E 01
		FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILCT RECORDER, F	0.1420E 03	TEMP. THERMOMETERS, F	0.1350E 03	MAKEUP FLUXS	
#1 ORIFICE	C.1350E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.1400E 03	ABS CYC. EXIT	0.1350E 03	PART. FINAL, GAL	0.3535E 03
P.P. EXIT	0.1400E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.7500E 02
PART. CYC. SUMP	0.1350E 03	ABS CYC. SUMP	0.1350E 03	ABS H2O IN. GAL	0.0
ABS CYC. SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI. GAL	0.6900E 02
FBA SUMP	0.1350E 03	MGO SLAK TANK	C.1920E 03	ABS H2O TIME, MIN	C.7500E 02
MGO SLAK TANK	0.1900E 03	MGOH2 TANK	C.1400E 03	MGO ROTU. SCALE, %	0.5000E 02
MGOH2 TANK	0.1420E 03			MAKEUP SETTING	C.5000E 02
MAKEUP WATER	C.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

SCRUBBER STREAM DATA				VENTUR I		ABSORBER		FBA	
PARTICULATE	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/H	TEMP, F	FLOW, #/H	TEMP, F	FLOW, #/H
MAKEUP WATER	62.0	4.71	MAKEUP WATER	***	***	62.0	7.7		
PRODUCT LIQ.	135.0	5.09	MAKEUP PGD SL.	***	6.4	142.0	5.5		
RECIRCULATED LIQ.	135.0	23.15	PRODUCT LIQ.	***	***	135.0	15.7		
			REC. (SPRAY NOZ)	***	***	135.0	336.0		
			REC. (FLOW NOZ.)	***	***		446.1		

2 ADSORPTION PARAMETERS		FLOATING BED ADSORBER		SULFATE FORMATION PARAMETERS		
VENTURI ADSORBER						
KGA, #MOLE/HR-FT ² ,	*****	KGA, #MOLE/HR-FT ²	=	56.6	CNC., GM-MOLE/L=	0.0374
SULFITE/SO ₂ -MOL/MOL	*****	SULFITE/SO ₂ -MOL/MOL	=	6.03	MOL % TOTAL SULF=	6.86
SUMP RESID.TIME, MIN	*****	SUMP RESID.TIME, MIN	=	20.1	O ₂ AT FURN. EX.=	4.00
					O ₂ AT ABSORB.IN=	*****
					O ₂ AT ABSORB.EX=	*****

ITEM	MEANS	ITEM	NOT MEASURED
1	1.00	1	1.00
2	1.00	2	1.00
3	1.00	3	1.00
4	1.00	4	1.00
5	1.00	5	1.00
6	1.00	6	1.00
7	1.00	7	1.00
8	1.00	8	1.00
9	1.00	9	1.00
10	1.00	10	1.00
11	1.00	11	1.00
12	1.00	12	1.00
13	1.00	13	1.00
14	1.00	14	1.00
15	1.00	15	1.00
16	1.00	16	1.00
17	1.00	17	1.00
18	1.00	18	1.00
19	1.00	19	1.00
20	1.00	20	1.00
21	1.00	21	1.00
22	1.00	22	1.00
23	1.00	23	1.00
24	1.00	24	1.00
25	1.00	25	1.00
26	1.00	26	1.00
27	1.00	27	1.00
28	1.00	28	1.00
29	1.00	29	1.00
30	1.00	30	1.00
31	1.00	31	1.00
32	1.00	32	1.00
33	1.00	33	1.00
34	1.00	34	1.00
35	1.00	35	1.00
36	1.00	36	1.00
37	1.00	37	1.00
38	1.00	38	1.00
39	1.00	39	1.00
40	1.00	40	1.00
41	1.00	41	1.00
42	1.00	42	1.00
43	1.00	43	1.00
44	1.00	44	1.00
45	1.00	45	1.00
46	1.00	46	1.00
47	1.00	47	1.00
48	1.00	48	1.00
49	1.00	49	1.00
50	1.00	50	1.00
51	1.00	51	1.00
52	1.00	52	1.00
53	1.00	53	1.00
54	1.00	54	1.00
55	1.00	55	1.00
56	1.00	56	1.00
57	1.00	57	1.00
58	1.00	58	1.00
59	1.00	59	1.00
60	1.00	60	1.00
61	1.00	61	1.00
62	1.00	62	1.00
63	1.00	63	1.00
64	1.00	64	1.00
65	1.00	65	1.00
66	1.00	66	1.00
67	1.00	67	1.00
68	1.00	68	1.00
69	1.00	69	1.00
70	1.00	70	1.00
71	1.00	71	1.00
72	1.00	72	1.00
73	1.00	73	1.00
74	1.00	74	1.00
75	1.00	75	1.00
76	1.00	76	1.00
77	1.00	77	1.00
78	1.00	78	1.00
79	1.00	79	1.00
80	1.00	80	1.00
81	1.00	81	1.00
82	1.00	82	1.00
83	1.00	83	1.00
84	1.00	84	1.00
85	1.00	85	1.00
86	1.00	86	1.00
87	1.00	87	1.00
88	1.00	88	1.00
89	1.00	89	1.00
90	1.00	90	1.00
91	1.00	91	1.00
92	1.00	92	1.00
93	1.00	93	1.00
94	1.00	94	1.00
95	1.00		

RUN NUMBER L-172 DATE 4-30-70 TIME OF DAY 1530

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PRUG.

FURNACE

INPUT FLOWS, #ATOMS/100#FEED

INPUT, #/HR 15.11
OUTPUT, #/HR 22.24

MAGNESIUM FLYASH WATER DRY GAS
30.22 276.3 5217.
***** 295.5 5224.

PART. SCRUBBER

INPUT FLOWS, #ATOMS/100#FEED

INPUT, #/HR 22.24
OUTPUT, #/HR 22.01

MAGNESIUM FLYASH WATER DRY GAS
***** 2654. 5224.
***** 3033. 5074.

SO2 ABSORBERS

FEED RATE, #/SEC = 1.52

INPUT, #/HR 22.01
OUTPUT, #/HR 17.30

MAGNESIUM FLYASH WATER DRY GAS
***** 1277. 5074.
***** 1360. 5529.

* SO2 ABSORBERS-PRODUCT COMP.

ENTHALPY, BTU/# = -2886.

TOTAL, 3.40
COMBINED 3.40
FREE 0.0
MONO(TOTAL) 3.40
MONO(DISSOLVED) 1.08
MONO(SOLID) 2.32
BISULFITE 0.16
MGO 0.15
SULFATE 0.24
MAGNESIUM 3.79
FLYASH -----
SOLIDS, NG -----

GM-MOLE/LITER 0.5318
0.5318
0.0
0.5318
0.1687
0.3630
0.0125
0.0228
0.0374
0.5920

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MFAS. = *****

PRODUCT NG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.20
SP.GRAVITY, HYDROM. = 1.0360

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = 2.00
FLYASH CONC. GM/100ML = 0.83

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-173	CARD NUMBER	2	CARD NUMBER	3
DATE	4-30-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, %SCALE	0.9900E 02
TIME	1700	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.9800E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1000E 01	SCREEN SPEED, RPM	0.4100E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1600E 01	O2 FURN. EX. 3-BM	0.1500E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5200E 01	COAL FURN. EX. 3	0.0
SEC. AIR DP, H2O	0.2100E 01	FURN. EX. ST, H2O	0.1200E 01	ELE. CHEN. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2910E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.1400E 03	PART. SCRUB. IN	0.4600E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.1600E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7500E 03	FBA INLET	0.1600E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANGMETER CODE	0	NO.1 BANK OUT	0.8400E 03	PRI. AIR FAN IN.	0.5900E 02
		NO.2 BANK OUT	0.7200E 03	PRI. AIR HGT BULB	0.7900E 02
CARD NUMBER	7	FURN. EXIT	0.4800E 03	SEC. AIR FAN IN.	0.7800E 02
MODE OF OPER.	3	COAL-AIR	0.1400E 03	SEC. AIR NET BULB	0.6900E 02
PART. SCR. ST, HG	0.1000E 00				
PART. SCR. DP, H2O	0.6000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.5800E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1200E 01
#1 ORIF. ST, HG	-0.1000E 01	ABS CYC. DP, H2O	0.0	FBA SURP DP, H2O	0.1000E 01
#1 ORIF. DP, H2O	0.4000E 01			FBA DP, H2O	0.7000E 01
				FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1330E 03	PART. CYC. EXIT	0.1380E 03	PART. INIT. GAL	0.0
FBA INLET	0.1380E 03	ABS CYC. EXIT	0.0	PART. FINAL. GAL	0.3535E 03
FBA EXIT	0.1340E 03	PART. CYC. SUMP	0.1350E 03	PART. TIME, MIN	0.7500E 02
P.P. EXIT	0.1340E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.0
PART. CYC. SUMP	0.1320E 03	FBA SUMP	0.1320E 03	ABS H2O FI. GAL	0.6900E 02
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1700E 03	ABS H2O TIME, MIN	0.7500E 02
FBA SUMP	0.1320E 03	MGO2 TANK	0.1420E 03	MGO ROTO. SCALE, %	0.5000E 02
MGO SLAK TANK	0.1720E 03			MAKEUP SETTING	0.5000E 02
MGO2 TANK	0.1400E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

DATE 4-30-7C TIME OF DAY 1700

TIME OF DAY 1700

RUN NUMBER L-173

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEN. POINT F	DRY FLOW #/HR	PRES IN.H2O	STAT
PRIMARY AIR	488.	140.0	---	---	---	---	0.018	78.7	479.	16.3	
SECONDARY AIR	4518.	750.0	---	---	---	---	0.015	72.7	4453.	6.0	
FURNACE EXIT	5441.	480.0	4071.4	**	**	**	0.061	118.3	5128.	1.2	
PART.SCRB.INLET	5441.	460.0	**	**	**	**	0.061	118.3	---	1.4	
PART.CYC.EXIT	5446.	138.0	3659.4	**	**	*	0.104	134.1	4934.	-13.5	
VENT.ABS.INLET	**	**	**	**	**	*	**	**	---	**	
ABS.CYC.EXIT	**	**	**	**	**	*	**	**	---	**	
FLOATING BED IN	5446.	138.0	**	**	**	*	0.104	134.1	---	-16.3	
FLOATING BED EX	6172.	134.0	**	**	**	*	0.099	131.8	---	-21.7	
P.P. EXIT GRIF.	6172.	134.0	33.8	**	**	*	0.099	131.8	5617.	-21.7	

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-173

DATE 4-30-70

TIME OF DAY 1700

MATERIAL BALANCES

FURNACE

INPUT, #/HR 16.93
OUTPUT, #/HR 21.65

PART. SCRUBBER

INPUT, #/HR 21.65
OUTPUT, #/HR 18.72

SO2 ABSORBERS

INPUT, #/HR 18.72
OUTPUT, #/HR 19.18

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL, 4.23
COMBINED 4.15
FREE 0.08
MONO(TOTAL) 4.06
MONO(DISSOLVED) 0.98
MONO(SOLID) 3.08
BISULFITE 0.48
MGO 0.0
SULFATE 0.19
MAGNESIUM 4.34
FLYASH
SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS

16.93 33.87 293.1 5119.
21.65 ***** 312.5 5128.

21.65 ***** 2671. 5128.
18.72 ***** 3061. 4934.

18.72 ***** 1304. 4934.
19.18 ***** 1346. 5617.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

4.23 0.6615
4.15 0.6483
0.08 0.0132
4.06 0.6351
0.98 0.1531
3.08 0.4820
0.48 0.0375
0.0 0.0
0.19 0.0295
4.34 0.6778

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.90
SP.GRAVITY, HYDROM. = 1.0520

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.515360
HYDROGEN 0.673560
OXYGEN 1.388556
NITROGEN 5.011559
SULFUR 0.009801

FEED RATE, #/SEC= 1.50

ENTHALPY, BTU/# = -3408.

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	L-174	CARD NUMBER	2	CARD NUMBER	3
DATE	4-30-70	WINDBOX ST, H2O	0.7200E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	2230	BURNER DP, H2O	0.5500E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCREEN SPEED, RPM	0.4400E 03
PRI. AIR DP, H2O	0.1900E 01	PP EXIT ST, HG	-0.1400E 01	O2 FURN. EX. % - BM	0.1800E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5000E 01	CUMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	FURN. EX. ST, H2O	0.2000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2898E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4100E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR DRIF.	0.1300E 03	PART. SCRUB. IN	0.4200E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX-TOP	0.7500E 03	#1 ORIFICE	0.1400E 03
ABS LOAD, PSIG	0.4800E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.1000E 03
ABS ORIF. INCH	0.4800E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK CUT	0.6800E 03	PRI. AIR FAN IN.	0.9300E 02
		NO. 2 BANK OUT	0.5900E 03	PRI. AIR WGT BULB	0.7500E 02
CARD NUMBER	7	FURN. EXIT	0.4300E 03	SEC. AIR FAN IN.	0.7700E 02
MODE OF OPER.	3	COAL-AIR	0.1300E 03	SEC. AIR WGT BULB	0.7000E 02
PART. SCR. ST, HG	0.5000E-01				
PART. SCR. DP, H2O	0.5200E 01				
PART. CYC. DP, H2O	0.5200E 01				
#1 ORIF. ST, HG	-0.7000E 00				
#1 ORIF. DP, H2O	0.3300E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.9000E 00
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.8000E 00
		FBA DP, H2O	0.6000E 01
		FBA DENIST. DP, H2O	0.1000E 01

CARD NUMBER	11	CARD NUMBER	12
TEMP. THERMOMETERS, F		MAKEUP FLOWS	
PART. CYC. EXIT	0.1360E 03	PART. INIT. GAL	0.3304E 05
ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.3339E 05
PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.6600E 02
ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.3860E 05
FBA SUMP	0.1340E 03	ABS H2O FI. GAL	0.3865E 05
MGO SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.6600E 02
MGOH2 TANK	0.1370E 03	MGO ROTO. SCALE, %	0.5400E 02
		MAKEUP SETTING	0.5400E 02

CARD NUMBER	10
TEMP. PILOT RECORDER, F	
#1 ORIFICE	0.1100E 03
FBA INLET	0.1360E 03
FBA EXIT	0.1290E 03
P. P. EXIT	0.1290E 03
PART. CYC. SUMP	0.1260E 03
ABS CYC. SUMP	0.8900E 02
FBA SUMP	0.1340E 03
MGO SLAK TANK	0.1770E 03
MGOH2 TANK	0.1330E 03
MAKEUP WATER	0.6000E 02

RUN NUMBER L-174

DATE 4-30-70

TIME OF DAY 2230

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SU2 PPM	SU3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/H	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	437.	130.0	---	---	---	---	0.016	74.6	431.	16.3
SECONDARY AIR	4652.	732.5	---	---	---	---	0.016	74.7	4581.	7.2
FURNACE EXIT	5525.	430.0	4320.6	---	---	---	0.061	118.2	5208.	2.0
PART. SCRB. INLET	5525.	420.0	---	---	---	---	0.061	118.2	---	0.7
PART. CYC. EXIT	4975.	136.0	426C.6	---	---	---	0.099	132.9	4526.	-9.5
VENT ABS. INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC. EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	4975.	136.0	---	---	---	---	0.099	132.9	---	-12.2
FLOATING BED EX	6087.	129.0	---	---	---	---	0.097	131.3	---	-19.0
P. EXIT ORIF.	6087.	129.0	56.8	---	---	---	0.097	131.3	5548.	-19.0

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FBA
	TEMP, F	FLOW, GPM	TEMP, F	FLOW, #/M
PARTICULATE				
MAKEUP WATER	60.0	5.17	60.0	6.5
PRODUCT LIQ.	132.0	4.99	133.0	5.8
RECIRCULATED LIQ.	132.0	23.45	134.0	11.6
			134.0	386.0
				455.7

FURNACE PERFORMANCE

FURNACE PERFORMANCE		SCRUBBER PERFORMANCE	
HEAT RELEASE, BTU/HR	0.577E 07	S02 ABSORB.EFF	1.39
% FUEL AS COAL	96.6	FLYASH COL.EFF	*****
COAL FLOW RATE, #/HR	458.3	S03 ABSORB.EFF	*****
NAT.GAS FLOW, #/HR	8.9	NOX ABSORB.EFF	*****
% EXCESS AIR	8.6	GAS VELOCITY, FPS	132.9
OXYGEN, % DRY, MEAS.	1.80	LIQ/GAS, GAL/MCF	17.8
CO2, % DRY-CALC.	16.52	LIQ/GAS, #/#	2.4
HUMIDITY, #/# - CALC.	0.061	PRES.DROP, IN. WG	5.2

SO2 ABSORPTION PARAMETERS

```
VENTURI ABSORBER
KGA, #MOLE/HR-FT2,      = *****
SULFITE/SC2-MCL/MOL    = *****
SUMP RESID.TIME,MIN    = *****
***** MEANS ITEM NOT MEASURED
```

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	49.3
SULFITE/SG2-MOL/MOL	=	5.80
SUMP RESID.TIME, MIN	=	5.9

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0323
MOLES TOTAL SULF=	3.67
Q2 AT FURN. EX.=	1.80
Q2 AT ABSORB. IN=	*****
Q2 AT ABSORB. EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER L-174

DATE 4-30-7C

TIME OF DAY 2230

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 16.96
 OUTPUT, #/HR 23.36
 PART. SCRUBBER
 INPUT, #/HR 23.36
 OUTPUT, #/HR 20.02

SO2 ABSORBERS
 INPUT, #/HR 20.02
 OUTPUT, #/HR 21.70

*SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL,
 COMBINED
 FREE
 MONO(TOTAL)
 MONO(DISSOLVED)
 MONO(SOLID)
 BISULFITE
 MG
 SULFATE
 MAGNESIUM
 FLYASH
 SOLIDS, MG

SULFUR
 16.96
 23.36
 23.36
 20.02

MAGNESIUM
 19.30
 15.83

FLYASH
 33.91
 317.3
 2903.
 2947.

WATER
 298.2
 317.3
 2903.
 2947.

DRY GAS
 5199.
 5208.
 5208.
 4526.

FEED RATE, #/SEC = 1.52

ENTHALPY, BTU/# = -3851.

MAKEUP-MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 9.20
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 7.30
 SP.GRAVITY, HYDROM. = 1.0540

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-175	CARD NUMBER	2	CARD NUMBER	3
DATE	5-12-7C	WINDBOX ST,H2O	0.8000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1200	BURNER DP,H2O	0.5600E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.3100E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.8000E 00	D2 FURN.EX.%-BM	0.3200E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVULT	0.0
		PELPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROM.FRIC,HG	0.2900E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECCORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR CRIF.	0.1400E 03	PART.SCRUB.IN	0.3000E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3800E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1400E 03
ABS CRIF.INCH	0.4400E 01	WINDBOX-EAST	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI.AIR FAN IN.	0.9400E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5200E 03	PRI.AIR WGT BULB	0.7500E 02
MCODE OF OPER.	5	FURN. EXIT	0.3200E 03	SEC.AIR FAN IN.	0.7700E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1100E 03	SEC.AIR WGT BULB	0.7000E 02
PART.SCR.DP,H2O	0.2000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.2000E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.2000E 00
#1 ORIF.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1200E 01
#1 CRIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.6800E 01
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILDT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3600E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1250E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1240E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.4030E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI.GAL	0.4039E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O TIME,MIN	0.6100E 02
FBA SUMP	0.1300E 03	MGOH2 TANK	0.1350E 03	MGO ROTC.SCALE,%	0.2000E 02
MGO SLAK TANK	0.1800E 03			MAKEUP SETTING	0.2000E 02
MGOH2 TANK	0.1360E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-175

DATE 5-12-70

TIME OF DAY 1200

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SC2 PPM	SC3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	500.	110.0	---	---	---	---	0.015	74.2	493.	16.3
SECONDARY AIR	4734.	747.5	---	---	---	---	0.016	74.9	4662.	8.0
FURNACE EXIT	5650.	320.0	3274.5	***	***	3.9848	0.058	116.5	5341.	2.2
PART.SCRB.INLET	***	***	***	***	***	***	***	***	---	***
PART.CYC.EXIT	4957.	380.0	***	***	***	***	0.058	116.4	4686.	1.4
VENT ABS.INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC.EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	4957.	140.0	***	***	***	***	0.058	116.4	---	-2.7
FLOATING BED EX	6116.	125.0	***	***	***	***	0.056	114.3	---	-10.8
P.P. EXIT ORIF.	6116.	124.0	28.0	***	***	0.0502	0.056	114.3	5791.	-10.8

SCRUBBER STREAM DATA

RUBBER STREAM DATA				VENTURI ABSORBER				FRA	
TEMP, F	FLCW, GPM	GAS ABSORBER	TEMP, F	FLCW, #/M	TEMP, F	FLCW, #/M	TEMP, F	FLCW, #/M	
*****	*****	MAKEUP WATER	*****	*****	62.0	12.4			
*****	*****	MAKEUP MGO SL.	*****	6.4	136.0	3.3			
*****	*****	PRODUCT LIQ.	*****	*****	135.0	12.8			
*****	*****	REC. (SPRAY NOZ)	*****	*****	135.0	394.7			
*****	*****	REC. (FLCW NOZ.)	*****	*****		436.3			

FURNACE PERFORMANCE

SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT.BED
S02 ABSORB.EFF	***	***	99.15
FLYASH COL.EFF	***	***	58.74
SO3 ABSORB.EFF	***	***	***
NOX ABSORB.EFF	***	***	***
GAS VELOCITY,FPS	***	***	12.2
LIQ/GAS,GAL/MCF	***	***	33.5
LIQ/GAS,#/#	***	***	4.3
PRES.DROP,IN.WG	***	***	6.8

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

FLUATING BED ABSORBER

SULFATE FORMATION PARAMETERS

KGA, #MOL/HR-FT2,	=	***	KGA, #MOL/HR-FT2	=	57.1	CONC. GR-MOLE/L =	0.0329
SULFITE/SO2-MOL/MOL	=	***	SULFITE/SO2-MOL/MOL	=	7.55	MOL% TOTAL SULF =	5.57
SUMP RESID.TIME, MIN	=	***	SUMP RESID.TIME, MIN	=	26.6	O2 AT FURN. EX. =	3.20
						O2 AT ABSORBER. IN =	***
						O2 AT ABSORBER. EX =	***

*****	MEANS	ITEM	NCT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-175

DATE 5-12-70

TIME OF DAY 1200

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FFED
CARBON 0.474779
HYDROGEN 0.611986
OXYGEN 1.393356
NITROGEN 5.048906
SULFUR 0.009024

FLED RATE, #/SEC= 1.56

ENTHALPY, BTU/° = -2859.

DRY GAS

5333.
5341.

WATER

290.1
309.3

FLYASH

32.34
35.58

MAGNESIUM

SULFUR

16.17
18.24

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

1197.
1046.

35.58

11.20
10.90

18.24
15.32

*SU2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.40
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MGO BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.10
SP. GRAVITY, HYDROM. = 1.0330

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	M-176	CARD NUMBER	2	CARD NUMBER	3
DATE	5-12-70	WINDBOX ST, H2O	0.8000E 01	N.G. FLOW, %SCALE	C.9800E 02
TIME	1330	BURNER DP, H2O	0.5600E 01	N.G. STATIC, R.O.	0.9400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCREEN SPEED, RPM	0.3100E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	0.8000E 00	O2 FURN. EX. %HM	0.3200E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4800E 01	CUMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.2200E 01	ELF. CHEM. VILVOLT	0.0
		PREPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2900E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR CRIF.	0.1400E 03	PART. SCRUB. IN	0.3000E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 CRIFICE	0.3800E 03
ABS LCAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FDA INLET	0.1400E 03
ABS CRIF. INCH	0.4400E 01	WINDBOX-EAST	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI. AIR FAN IN.	0.9400E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5200E 03	PRI. AIR WGT BULB	0.7500E 02
MODE OF OPER.		FURN. EXIT	0.3200E 03	SEC. AIR FAN IN.	0.7700E 02
PART. SCR. ST, HG	0.2000E 00	COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.7000E 02
PART. SCR. DP, H2O	0.2000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.2000E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.2000E 00
#1 CRIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1200E 01
#1 CRIF. DP, H2O	0.4400E 01			FBA DP, H2O	0.6800E 01
				FBA DENIST. DP, H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLWS	
#1 CRIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1250E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4030E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI. GAL	0.4039E 05
ABS CYC. SUMP	0.0	MGD SLAK TANK	0.1800E 03	ABS H2O TIME, MIN	0.6100E 02
FBA SUMP	0.1300E 03	MGCH2 TANK	0.1350E 03	MGD ROTO. SCALE, %	0.2000E 02
MGD SLAK TANK	0.1800E 03			MAKEUP SETTING	0.2000E 02
MGCH2 TANK	0.1360E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-176

DATE 5-12-70

TIME OF DAY 1330

FLUE GAS DATA

FLUE GAS DATA	FLOW #/HR	TEMP. F	SU2 PPM	SO3 PPM	NCX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRIS IN.H2O
PRIMARY AIR	500.	110.0	---	---	---	---	0.015	74.2	493.	16.3
SECONDARY AIR	4734.	750.0	---	---	---	---	0.016	74.9	4662.	8.0
FURNACE EXIT	5650.	320.0	2570.4	***	497.	***	0.058	116.5	5341.	2.2
PART.SCRB.INLET	***	***	***	***	***	***	***	***	---	***
PART.CYC.EXIT	4957.	380.0	***	***	***	***	0.059	116.4	4686.	1.4
VENT ABS.INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC.EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	4957.	140.0	***	***	***	***	0.058	116.4	---	-2.7
FLOATING BED EX	6116.	125.0	***	***	***	***	0.056	114.3	---	-10.8
P.P. EXIT ORIF.	611b.	124.0	45.2	***	669.	***	0.056	114.3	5791.	-10.8

SCRUBBER STREAM DATA

RUBBER STREAM DATA				VENTURI ABSORBER				FBA
TEMP,F	FLCW,GPM	GAS ABSORBER	TEMP,F	FLCW,#/M	TEMP,F	FLCW,#/M		
*****	*****	MAKEUP WATER	*****	*****	62.0	12.4		
*****	*****	MAKEUP HGU SL.	*****	6.4	136.0	3.3		
*****	*****	PRODUCT LIQ.	*****	*****	135.0	12.8		
*****	*****	REC.(SPRAY NOZ)	*****	*****	135.0	394.7		
*****	*****	REC.(FLOW NOZ.)	*****	*****		436.3		

FURNACE PERFORMANCE

BURNANCE PERFORMANCE		SCRUBBER PERFORMANCE		PART.	VENT ABS.	FLOAT. RED
HEAT RELEASE, BTU/HR	0.552E 07	SO2 ABSORB. EFF	**	**	**	98.20
% FUEL AS COAL	96.4	FLYASH COL. EFF	**	**	**	**
COAL FLOW RATE, #/HR	437.0	SO3 ABSORB. EFF	**	**	**	**
NAT. GAS FLOW, #/HR	8.9	NOX ABSORB. EFF	**	**	**	-34.52
% EXCESS AIR	15.2	GAS VELOCITY, FPS	**	**	**	12.2
UXYGEN, DRY, MEAS.	3.20	LIQ/GAS, GAL/ACF	**	**	**	33.5
CO2, DRY-CALC.	15.30	LIQ/GAS, #/#	**	**	**	4.3
HUMIDITY, #/# - CALC.	0.058	PAES. DROP, IN. HG	**	**	**	6.8

SD2 ABSORPTION PARAMETERS

ABSORPTION PARAMETERS		FLOATING BED ABSORBER		SULFATE FORMATION PARAMETERS	
ENTURI ABSORBER					
KGA, #MOLE/HR-FT ² , =	*****	KGA, #MOLE/HR-FT ²	=	CONC., GM-MOLE/L =	0.0324
SULFITE/SO ₂ -MOL/MOL =	*****	SULFITE/SO ₂ -MOL/MOL	=	MOL% TOTAL SULF =	5.20
SUMP RESID. TIME, MIN =	*****	SUMP RESID. TIME, MIN	=	O ₂ AT FURN. EX. =	3.20
				O ₂ AT ABSORB. IN =	*****
				O ₂ AT ABSORB. EX =	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-176

DATE 5-12-70

TIME OF DAY 1330

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	16.17	-----	-----	32.34	290.1	5333.	
OUTPUT, #/HR	14.32	-----	-----	*****	309.3	5341.	
PART. SCRUBBER		*****	-----	*****	*****	*****	
INPUT, #/HR	*****	-----	-----	*****	*****	*****	
OUTPUT, #/HR	*****	-----	-----	*****	*****	*****	
SO2 ABSORBERS		14.32	*****	*****	1216.	4686.	
INPUT, #/HR	16.46	14.90	*****	*****	1034.	5791.	
OUTPUT, #/HR							

* SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	4.01	GM SO2/ 100ML	GRAM/ 100ML	
COMBINED	4.01			
FREE	0.0			
MONO(TOTAL)	4.01			
MONO(DISSOLVED)	1.10			
MONO(SOLID)	2.91			
BISULFITE	0.0			
MGO	0.95			
SULFATE	0.21			
MAGNESIUM	5.17			
FLYASH	-----			
SOLIDS, MG	-----			

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.043H

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PRNG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.474779
 HYDROGEN 0.611986
 OXYGEN 1.393356
 NITROGEN 5.048906
 SULFUR 0.009024

FEED RATE, #/SEC= 1.56

ENTHALPY, BTU/# = -2800.

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = *****
 MGD PRESLAKED, NO=0, YES=1 1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 8.20
 SP.GRAVITY, HYDROM. = 1.0370

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-177	CARD NUMBER	2	CARD NUMBER	3
DATE	5-12-70	WINDBOX ST, H2O	0.8000E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1500	BURNER DP, H2O	C.5600E 01	N.G. STATIC, R.O.	C.9400E 01
PRI. AIR ST, HG	C.1200E 01	FURN. ST, H2O	0.2000E 01	SCREEN SPEED, RPM	0.3100E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.8000E 00	O2 FURN. EX. X-RM	C.3200E 01
SEC. AIR ST, HG	C.1500E 01	PP EXIT DP, H2O	0.4800E 01	CUMF. FURN. EX. X	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	C.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P-SITE ST, PSIG	C.0	BAROMETRIC, HG	C.2900E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR CRIF.	0.1400E 03	PART. SCRUB. IN.	0.3000E 03
ABS NOZ., PSIG	C.2700E 02	WINDBOX-TUP	0.7600E 03	#1 DRIFICE	C.3800E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1400E 03
ABS DRIF. INCH	0.4400E 01	WINDBOX-BOT.	C.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	C.8500E 03
MANOMETER CODE	0	NO.1 BANK CUT	C.6000E 03	PRI. AIR FAN IN.	0.9400E 02
		NO.2 BANK CUT	0.5200E 03	PRI. AIR WGT BULB	C.7500E 02
CARD NUMBER	7	FURN. EXIT	0.3200E 03	SEC. AIR FAN IN.	0.7700E 02
MODE OF OPER.	5	COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.7000E 02
PART. SCR. ST, HG	C.2000E 00				
PART. SCR. DP, H2O	0.2000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.2000E 01	VENT. ABS. DP, H2O	C.0	FBA INLET ST, HG	-0.2000E 00
#1 DRIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	C.0	FBA SUMP DP, H2O	C.1200E 01
#1 DRIF. DP, H2O	0.4400E 01			FBA DP, H2O	0.6800E 01
				FBA DEMIST. DP, H2O	C.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 DRIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1250E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4030E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI. GAL	0.4039E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	C.1500E 03	ABS H2O TIME, MIN	C.6100E 02
FBA SUMP	C.1300E 03	MGOH2 TANK	0.1350E 03	MGO ROTU. SCALE, %	C.2000E 02
MGO SLAK TANK	0.1800E 03			MAKEUP SETTING	0.2000E 02
MGOH2 TANK	0.1360E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-177

DATE 5-12-70

TIME OF DAY 1500

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/H	DEM POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	500.	110.0	---	---	---	---	0.015	74.2	493.	16.3
SECONDARY AIR	4734.	750.0	---	---	---	---	0.016	74.9	4662.	8.0
FURNACE EXIT	5650.	320.0	2440.2	---	---	---	0.058	116.5	5341.	2.2
PART.SCRB.INLET	---	---	---	---	---	---	---	---	---	---
PART.CYC.EXIT	4957.	380.0	---	---	---	---	0.058	116.4	4686.	1.4
VENT ADS.INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC.EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	4957.	140.0	---	---	---	---	0.058	116.4	---	-2.7
FLOATING BED EX	6116.	125.0	---	---	---	---	0.056	114.3	---	-10.8
P.P. EXIT DRIF.	6115.	124.0	45.8	---	---	---	0.056	114.3	5791.	-10.8

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/H	FBA
PARTICULATE	---	---	---	---	---	---	---
MAKEUP WATER	---	---	MAKEUP WATER	---	---	---	---
PRODUCT LIQ.	---	---	MAKEUP MGD SL.	---	---	---	---
RECIRCULATED LIQ.	---	---	PRODUCT LIQ.	---	---	---	---
	---	---	REC.(SPRAY NOZ)	---	---	---	---
	---	---	REC.(FLOW NOZ.)	---	---	---	---

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.552E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	437.0
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	15.2
OXYGEN,DORY,MEAS.	3.20
CO2,DRY-CALC.	15.30
HUMIDITY,#/# - CALC.	0.058

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	*****
SULFITE/SC2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	---
FLYASH CUL.EFF	---
SO3 ABSORB.EFF	---
NOX ABSORB.EFF	---
GAS VELOCITY,FPS	---
LIQ/GAS,GAL/MCF	---
LIQ/GAS,#/#	---
PRES.DROP,IN.WG	---

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	47.7
SULFITE/SC2-MOL/MOL	=	11.56
SUMP RESID.TIME,MIN	=	26.6

VENT ABS.

PART.	---
---	---
---	---
---	---
---	---
---	---
---	---
---	---

FLOAT.BED

98.12	---
---	---
---	---
---	---
---	---
12.2	---
33.5	---
4.3	---
6.8	---

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L=	0.0482
MOL% TOTAL SULF=	9.18
O2 AT FURN.EX.=	3.20
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-177

DATE 5-12-70

TIME OF DAY 1500

MATERIAL BALANCES

FURNACE
INPUT, #/HR 16.17
OUTPUT, #/HR 13.59

PART. SCRUBBER
INPUT, #/HR *****
OUTPUT, #/HR *****

SO2 ABSORBERS
INPUT, #/HR 13.59
OUTPUT, #/HR 13.62

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 3.17
COMBINED 3.17
FREE 0.0
MONG(TOTAL) 3.17
MONG(DISSOLVED) 1.30
MONG(SOLID) 1.87
BISULFITE 0.0
MGO 0.31
SULFATE 0.31
MAGNESIUM 3.79
FLYASH -----
SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR
MAGNESIUM
FLYASH
WATER
CRY GAS

16.17

13.59

32.34

13.59

13.62

32.34

13.59

13.62

32.34

13.59

13.62

32.34

13.59

13.62

32.34

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.474779
HYDROGEN 0.611986
OXYGEN 1.393356
NITROGEN 5.048906
SULFUR 0.009024

FEED RATE, #/SEC = 1.56

ENTHALPY, BTU/# = -2800.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.40
SP. GRAVITY, HYDRUM. = 1.0320

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

*
* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-178	CARD NUMBER	2	CARD NUMBER	3
DATE	5-12-70	WINDBOX ST, H2O	0.8000E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1630	BURNER DP, H2O	C.5400E 01	N.G. STATIC, R.U.	C.9400E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.3000E 01	SCREW SPEED, RPM.	C.3000E 03
PRI. AIR DP, H2O	C.2400E 01	PP EXIT ST, HG	-0.8000E 00	O2 FURN. EX. % - BM	0.4400E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.4400E 01	CONB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	C.3000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	C.2900E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1300E 03	PART. SCRUB. IN	0.3900E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	C.7600E 03	#1 CRIFICE	0.4000E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3300E 03
ABS ORIF. INCH	0.4400E 01	WINDBOX-BCT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7550E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	C.6250E 03	PRI. AIR FAN IN.	C.9500E 02
		NO.2 BANK OUT	0.5400E 03	PRI. AIR WGT BULB	0.7100E 02
CARD NUMBER	7	FURN. EXIT	0.4400E 03	SEC. AIR FAN IN.	0.7800E 02
MODE OF OPER.	5	COAL-AIR	0.1100E 03	SEC. AIR WET BULB	0.7200E 02
PART. SCR. ST, HG	0.2000E 00				
PART. SCR. DP, H2O	0.2000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.2000E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.2000E 00
#1 CRIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	C.1200E 01
#1 URIF. DP, H2O	0.4400E 01			FBA DP, H2O	C.6800E 01
				FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 CRIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3500E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1250E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4030E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI. GAL	0.4039E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	C.1800E 03	ABS H2O TIME, MIN	0.6100E 02
FBA SUMP	0.1300E 03	MGOH2 TANK	0.1350E 03	MGO ROTU. SCALE, %	0.2000E 02
MGO SLAK TANK	0.1800E 03			MAKEUP SETTING	0.2000E 02
MGOH2 TANK	0.1360E 03				
MAKEUP WATER	0.6200E 02				

FLUE GAS DATA

UNIT	TEMP.	SC2	SC3	NOX	FLYASH	HUM.	DEW	DRY	STAT
	F	PPM	PPM	PPM	GR/DSCF	#/#	POINT	FLOW	PRES
							F	#/HR	IN. H2O
PRIMARY AIR	110.0	---	---	---	---	0.012	66.8	495.	16.3
SECONDARY AIR	743.8	---	---	---	---	0.017	77.1	4670.	8.0
FURNACE EXIT	440.0	2430.5	10.5	***	***	0.056	115.5	5338.	3.0
PART.SCRB.INLET	***	***	***	***	***	***	***	---	***
PART.CYC.EXIT	400.0	***	***	***	***	0.056	115.3	4632.	1.4
VENT ASS.INLET	***	***	***	***	***	***	***	---	***
ABS CYC.EXIT	***	***	***	***	***	***	***	---	***
FLOATING BED IN	330.0	***	***	***	***	0.056	115.3	---	-2.7
FLOATING BED EX	125.0	***	***	***	***	0.099	132.6	---	-10.8
P.P. EXIT CRIP.	124.0	60.6	***	***	***	0.099	132.6	5251.	-10.8

SCRUBBER STREAM DATA

RUBBER STREAM DATA				VENTURI ABSORBER				FBA	
	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/N	TEMP, F	FLOW, #/N		
PARTICULATE	***	***	MAKEUP WATER	***	***	62.0	12.4		
MAKEUP WATER	***	***	MAKEUP NO. SL.	***	6.4	136.0	3.3		
PRODUCT LIQ.	***	***	PRODUCT LIQ.	***	---	135.0	12.8		
RECIRCULATED LIQ.	***	***	REC. (SPRAY NOZ.)	***	***	135.0	394.7		
			REC. (FLOW NOZ.)	***	***		436.3		

FURNACE PERFORMANCE

[illegible]

SC2 ABSORPTION PARAMETERS

VENTURI ABSORBER

```

** **      =
** **      =
** **      =
** **      =

```

*** MEANS ITEM NOT MEASURED

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	40.3	CONC., GM-MOLE/L =	0.0590
SULFITE/SO2-MOL/MOL	=	8.82	MUL% TOTAL SULF=	11.22
SUMP RESID. TIME, MIN	=	26.6	O2 AT FURN. EX. =	4.40
			O2 AT ABSORB. IN=	*****
			O2 AT ABSORB. EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-178

DATE 5-12-70

TIME OF DAY 1630

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PRUG.
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.445414
 HYDROGEN 0.551229
 OXYGEN 1.396782
 NITROGEN 5.075941
 SULFUR 0.008453

FEED RATE, #/SEC = 1.55

ENTHALPY, BTU/# = -2702.

SO2 ABSORBERS
 INPUT, #/HR 13.59
 OUTPUT, #/HR 13.71

* SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 3.11
 COMBINED 2.94
 FREE 0.17
 MONO(TOTAL) 2.78
 MONO(DISSOLVED) 0.90
 MONO(SOLID) 1.88
 BISULFITE 0.28
 MGO 0.0
 SULFATE 0.38
 MAGNESIUM 3.32
 FLYASH
 SOLIDS, MG

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****
 MGO PRESLAKED, NO=0, YES=1 1
 % SLAKED TO MG(OH)2, REAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.50
 SP. GRAVITY, HYDROM. = 1.0430

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-179	CARD NUMBER	2	CARD NUMBER	3
DATE	5-12-70	WINDBOX ST,H2O	0.8500E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1800	BURNER DP,H2O	0.5800E 01	N.G. STATIC,R.O.	0.8700E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.2000E 01	SCREW SPEED,RPM	0.3000E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.7000E 00	D2 FURN.EX,%-BM	0.4500E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.2000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BARUMETRIC,HG	0.2899E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR ORIF.	0.1300E 03	PART.SCRUB.IN	0.3900E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7000E 03	#1 ORIFICE	0.3900E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3200E 03
ABS ORIF.INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
NANOMETER CODE	0	NO.1 BANK OUT	0.6400E 03	PRI.AIR FAN IN.	0.8800E 02
		NO.2 BANK OUT	0.5500E 03	PRI.AIR WGT BULB	0.7500E 02
CARD NUMBER	7	FURN. EXIT	0.4400E 03	SEC.AIR FAN IN.	0.6900E 02
MODE OF OPER.	5	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.6900E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.0	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.2000E 00
#1 ORIF.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1200E 01
#1 ORIF.DP,H2O	0.4500E 01			FBA DP,H2O	0.6000E 01
				FBA DEMIST.DP,H2O	0.2000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4100E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3200E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1290E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.4039E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1330E 03	ABS H2O FI,GAL	0.4047E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1560E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1210E 03	MGOH2 TANK	0.1320E 03	MGO ROTO.SCALE,%	0.1900E 02
MGO SLAK TANK	0.1540E 03			MAKEUP SETTING	0.1900E 02
MGOH2 TANK	0.1310E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-179

DATE 5-12-70

TIME OF DAY 1800

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRFS IN.H2O
PRIMARY AIR	501.	110.0	---	---	---	---	0.017	76.5	493.	17.6
SECONDARY AIR	4667.	741.3	---	---	---	---	0.016	76.5	4592.	8.5
FURNACE EXIT	5549.	440.0	2336.9	***	***	***	0.056	115.2	5254.	2.0
PART.SCRB.INLET	***	***	***	***	***	***	***	***	---	***
PART.CYC.EXIT	4975.	390.0	***	***	***	***	0.056	115.2	4711.	1.4
VENT ABS.INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC.EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	4975.	320.0	***	***	***	***	0.056	115.2	---	-2.7
FLOATING BED EX	6028.	129.0	***	***	***	***	0.096	131.7	---	-9.5
P.P. EXIT ORIF.	6028.	127.0	25.3	***	***	***	0.096	131.7	5498.	-9.5

SCRUBBER STREAM DATA

RUBBER STREAM DATA				VENTURI ABSORBER				FGA	
	TEMP, F	FLOW, GPM		TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M		
ARTICULATE	*****	*****	GAS ABSORBER	*****	*****	60.0	11.5		
MAKEUP WATER	*****	*****	MAKEUP WATER	*****	*****	131.0	3.2		
PRODUCT LIQ.	*****	*****	MAKEUP MGD SL.	*****	6.4	133.0	12.0		
RECIRCULATED LIQ.	*****	*****	PRODUCT LIQ.	*****	*****	133.0	394.7		
			REC. (SPRAY NOZ.)	*****	*****	133.0	446.1		
			REC. (FLOW NOZ.)	*****	*****				

FURNACE PERFORMANCE

[illegible]

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER		FLOATING BED ABSORBER
KGA, #MOLE/HR-FT ² ,	*****	KGA, #MOLE/HR-FT ²
SULFITE/SO ₂ -MOL/MOL	*****	SULFITE/SO ₂ -MOL/MOL
SUMP RESID.TIME,MIN	*****	SUMP RESID.TIME,MIN

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L =	0.0334
MOL% TOTAL SULF =	7.36
O2 AT FURN. EX. =	4.50
O2 AT ABSORB. IN =	*****
O2 AT ABSORB. EX =	*****

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-179

DATE 5-12-70

TIME OF DAY 1800

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 14.77
 OUTPUT, #/HR 12.86
 PART. SCRUBBER
 INPUT, #/HR
 OUTPUT, #/HR
 INPUT FLOW, #ATOMS/100#FEED
 CARBON 0.442872
 HYDROGEN 0.596860
 OXYGEN 1.397063
 NITROGEN 5.078287
 SULFUR 0.008401

SO2 ABSORBERS
 INPUT, #/HR 12.86
 OUTPUT, #/HR 11.01

* SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 2.81
 COMBINED 2.54
 FREE 0.27
 MONO(TOTAL) 2.27
 MONO(DISSOLVED) 0.96
 MONO(SOLID) 1.31
 BISULFITE 0.08
 MGO 0.0
 SULFATE 0.21
 MAGNESIUM 2.75
 FLYASH
 SOLIDS, MG

FEED RATE, #/SEC = 1.53
 ENTHALPY, BTU/# = -2723.

MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML =
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 7.80
 SP. GRAVITY, HYDROM. = 1.0370

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH =
 FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-180	CARD NUMBER	2	CARD NUMBER	3
DATE	5-12-70	WINDBOX ST,H2O	0.9000E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	2100	BURNER DP,H2O	0.5700E 01	N.G. STATIC,R.O.	0.8400E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.4000E 01	SCREW SPEED,RPM	0.3000E 03
PRI.AIR DP,H2O	0.2200E 01	PP EXIT ST,HG	-0.7000E 00	02 FURN.EX.%-RM	0.4400E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.4000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2892E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F	0.1250E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR ORIF.	0.7600E 03	PART.SCRUB.IN	0.4050E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7300E 03	#1 ORIFICE	0.4050E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FRA INLET	0.3350E 03
ABS ORIF.INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDROX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 02
MANOMETER CODE	0	NO.1 BANK OUT	0.6450E 03	PRI.AIR FAN IN.	0.8100E 02
		NO.2 BANK OUT	0.5550E 03	PRI.AIR NGT BULB	0.6900E 02
CARD NUMBER	7	FURN. EXIT	0.4450E 03	SEC.AIR FAN IN.	0.6900E 02
MODE OF OPER.	5	CUAL-AIR	0.1050E 03	SEC.AIR WET BULB	0.6400E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H2O	0.0				
PART.CYC.DP,H2O	0.0				
#1 ORIF.ST,HG	0.2000E 00				
#1 ORIF.DP,H2O	0.4500E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1500E 00
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1400E 01
		FBA DP,H2O	0.6200E 01
		FBA DEMIST.DP,H2O	0.7000E 00

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4100E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3350E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1290E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1290E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.4063E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O FI,GAL	0.4072E 05
ABS CYC.SUMP	0.0	MGD SLAK TANK	0.7000E 02	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1200E 03	MGDH2 TANK	0.1470E 03	MGD ROTO.SCALE,%	0.1500E 02
MGD SLAK TANK	0.7000E 02			MAKEUP SETTING	0.1500E 02
MGDH2 TANK	0.1430E 03				
MAKEUP WATER	0.0				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-180

DATE 5-12-70

TIME OF DAY 2100

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN-H2O
PRIMARY AIR	481.	105.0	---	---	---	---	0.013	69.9	475.	17.6
SECONDARY AIR	4687.	741.3	---	---	---	---	0.013	69.1	4627.	9.0
FURNACE EXIT	5552.	445.0	2710.9	---	---	---	0.053	113.4	5274.	4.0
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	4940.	405.0	*****	*****	*****	*****	0.053	113.3	4692.	2.7
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	4940.	335.0	*****	*****	*****	*****	0.053	113.3	---	-2.0
FLOATING BED EX	6017.	129.0	*****	*****	*****	*****	0.093	130.5	---	-9.5
P.P. EXIT ORIF.	6017.	129.0	14.1	*****	*****	*****	0.093	130.5	5505.	-9.5

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	*****	*****	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	*****	0.0 12.6
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	143.0 2.9
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ.)	*****	134.0 9.0
			REC.(FLOW NOZ.)	*****	134.0 394.7
				*****	446.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.510E 07
% FUEL AS COAL	96.2
COAL FLOW RATE,#/HR	403.0
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	21.0
OXYGEN,% DRY, MEAS.	4.40
CO2,% DRY-CALC.	14.25
HUMIDITY,#/# - CALC.	0.053

SCRUBBER PERFORMANCE

PART.	SO2 ABSORB.EFF	FLYASH COL.EFF	SO3 ABSORB.EFF	NOX ABSORB.EFF	GAS VELOCITY,FPS	LIQ/GAS,GAL/MCF	LIQ/GAS,#/#	PRES.DRGP,IN.WG
SO2 ABSORB.EFF	*****	*****	*****	*****	*****	*****	*****	*****
FLYASH COL.EFF	*****	*****	*****	*****	*****	*****	*****	*****
SO3 ABSORB.EFF	*****	*****	*****	*****	*****	*****	*****	*****
NOX ABSORB.EFF	*****	*****	*****	*****	*****	*****	*****	*****
GAS VELOCITY,FPS	*****	*****	*****	*****	*****	*****	*****	*****
LIQ/GAS,GAL/MCF	*****	*****	*****	*****	*****	*****	*****	*****
LIQ/GAS,#/#	*****	*****	*****	*****	*****	*****	*****	*****
PRES.DRGP,IN.WG	*****	*****	*****	*****	*****	*****	*****	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****
***** MEANS ITEM NOT MEASURED	

FLCATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	60.1
SULFITE/SO2-MOL/MOL	=	9.77
SUMP RESID.TIME,MIN	=	40.3

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L=	0.0379
MUL% TOTAL SULF=	10.02
O2 AT FURN.EX.=	4.40
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-180

DATE 5-12-70

TIME OF DAY 2100

MATERIAL BALANCES

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.445372
HYDROGEN 0.565247
OXYGEN 1.396779
NITROGEN 5.075983
SULFUR 0.008451

FEED RATE, #/SEC = 1.53

ENTHALPY, BTU/# = -948.

DRY GAS

5267.
5274.

WATER

259.4
278.5

FLYASH

29.82

MAGNESIUM

SULFUR

14.91
14.97

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR
OUTPUT, #/HR

4692.
5505.

1164.
1032.

11.22
5.03

14.97
6.78

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML

2.22
2.22
0.0
2.22
1.14
1.08
0.08
0.0
0.24
2.47

GM-MOLE/
LITER

0.3476
0.3476
0.0
0.3476
0.1781
0.1695
0.0062
0.0
0.0379
0.3855

GRAM/
100ML

1.852
3.593
0.116
0.0
0.454

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 10.60
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES*

ACID STRENGTH, PH = 7.20
SP.GRAVITY, HYDROM. = 1.0350

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-181	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST, H2O	0.6500E 01	N.G. FLOW, %SCALE	0.1000E 03
TIME	0001	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.8500E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.1500E 01	SCREW SPEED, RPM	0.3200E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1000E 01	O2 FURN. EX. T-BM	0.4100E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.5300E 01	COB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2500E 01	FURN. EX. ST, H2O	0.1500E 01	ELF. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2892E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1200E 03	PART. SCRUB. IN	
ABS NOZ., PSIG	0.2750E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3900E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FRA INLET	0.3300E 03
ABS ORIF. INCH	0.4600E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANGMETER CODE	0	NO.1 BANK OUT	0.5900E 03	PRI. AIR FAN IN.	0.8100E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5150E 03	PPI. AIR VGT BULB	0.6900E 02
MODE OF OPER.	5	FURN. EXIT	0.4300E 03	SEC. AIR FAN IN.	0.6200E 02
PART. SCR. ST, HG	0.0	COAL-AIR	0.1100E 03	SEC. AIR WET BULB	0.6100E 02
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.4000E 00
#1 ORIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1800E 01
#1 ORIF. DP, H2O	0.4800E 01	CARD NUMBER	11	FBA DP, H2O	0.6600E 01
CARD NUMBER	10	TEMP. THERMOMETERS, F		FBA DENIST. DP, H2O	0.4000E 00
TEMP. PILOT RECORDER, F		PART. CYC. EXIT	0.0	CARD NUMBER	12
#1 ORIFICE	0.4100E 03	ABS CYC. EXIT	0.0	MAKEUP FLUWS	
FBA INLET	0.3300E 03	PART. CYC. SUMP	0.0	PART. INIT. GAL	0.0
FBA EXIT	0.1290E 03	ABS CYC. SUMP	0.0	PART. FINAL, GAL	0.0
P. P. EXIT	0.1280E 03	FBA SUMP	0.1340E 03	PART. TIME, MIN	0.0
PART. CYC. SUMP	0.0	MGO SLAK TANK	0.2120E 03	ABS H2O IN. GAL	0.4087E 05
ABS CYC. SUMP	0.0	MGOH2 TANK	0.1350E 03	ABS H2O FI. GAL	0.4094E 05
FBA SUMP	0.1170E 03	MAKEUP WATER	0.6000E 02	ABS H2O TIME, MIN	0.6000E 02
MGO SLAK TANK	0.2090E 03			MGO ROTO. SCALE, %	0.1600E 02
MGOH2 TANK	0.1320E 03			MAKEUP SETTING	0.1600E 02

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-181

DATE 5-13-70

TIME OF DAY 0001

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	
INPUT, #/HR	16.19			32.37	277.5	5609.	
OUTPUT, #/HR	14.94			*****	297.0	5617.	
PART. SCRUBBER							
INPUT, #/HR	*****			*****	*****	*****	
OUTPUT, #/HR	*****			*****	*****	*****	

INPUT FOR EQ. - KIN.PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.452993
 HYDROGEN 0.570634
 OXYGEN 1.395939
 NITROGEN 5.068953
 SULFUR 0.008607

FEED RATE, #/SEC = 1.63

ENTHALPY, BTU/# = -733.

SO2 ABSORBERS
 INPUT, #/HR
 OUTPUT, #/HR

11.39
 10.45

1030.
 1236.

4863.
 5755.

* SO2 ABSORBERS-
 PRODUCT COMP.

GM SO2/
 100ML

GM-MOLE/
 LITER

GRAM/
 100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 10.50
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
 COMBINED
 FREE
 MONO(TOTAL)
 MONO(DISSOLVED)
 MONO(SOLID)
 BISULFITE
 MGO
 SULFATE
 MAGNESIUM
 FLYASH
 SOLIDS, MG

3.14
 3.14
 0.0
 3.14
 1.12
 2.02
 0.0
 0.21
 0.41
 3.75

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.00
 SP.GRAVITY, HYDROM. = 1.0360

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-182	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST,H2O	0.7000E 01	N.G. FLOW,%SCALE	0.1000E 03
TIME	0200	BURNER DP,H2O	0.5800E 01	N.G. STATIC,R.O.	0.8500E 01
PRI.AIR ST, HG	0.1300E 01	FURN. ST,H2O	0.1500E 01	SCREW SPEED,RPM	0.3300E 03
PRI.AIR DP,H2O	0.2300E 01	PP EXIT ST,HG	-0.1000E 01	O2 FURN.EX,%-BM	0.4200E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.5300E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.1500E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2892E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR ORIF.	0.1250E 03	PART.SCRUB.IN	0.4000E 03
ABS NOZ.,PSIG	0.2750E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.4000E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3300E 03
ABS ORIF.INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI.AIR FAN IN.	0.8500E 02
		NO.2 BANK OUT	0.5250E 03	PRI.AIR WGT BULB	0.7000E 02
CARD NUMBER	7	FURN. EXIT	0.4350E 03	SEC.AIR FAN IN.	0.6400E 02
MODE OF OPER.	5	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.6200E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.0	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.4000E 00
#1 ORIF.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.2200E 01
#1 ORIF.DP,H2O	0.4800E 01			FBA DP,H2O	0.6500E 01
				FBA DEMIST.DP,H2O	0.7000E 00

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMUMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4100E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3600E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1290E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1290E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.4101E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O FI.GAL	0.4108E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1940E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1170E 03	MGOH2 TANK	0.1290E 03	MGO ROTO.SCALE,%	0.1600E 02
MGO SLAK TANK	0.1890E 03			MAKEUP SETTING	0.1600E 02
MGOH2 TANK	0.1250E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-182

DATE 5-13-70

TIME OF DAY 0200

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	490.	110.0	----	----	----	----	0.013	69.7	484.	17.6
SECONDARY AIR	4792.	741.3	----	----	----	----	0.013	68.4	4733.	7.0
FURNACE EXIT	5680.	435.0	2426.7	----	----	----	0.053	113.3	5394.	1.5
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
PART.CYC.EXIT	5110.	400.0	*****	*****	*****	*****	0.053	113.3	4853.	1.4
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN	5110.	330.0	*****	*****	*****	*****	0.053	113.3	-----	-5.4
FLOATING BED EX	6286.	129.0	*****	*****	*****	*****	0.095	130.9	-----	-13.5
P.P. EXIT ORIF.	6286.	129.0	15.3	*****	*****	*****	0.095	130.9	5739.	-13.5

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M	TEMP,F	FLOW,#/M
PARTICULATE	*****	*****	MAKEUP WATER	*****	*****	*****	60.0	9.9
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	*****	*****	6.4	125.0	3.0
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	*****	*****	134.0	11.1
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	*****	*****	*****	134.0	399.0
			REC.(FLOW NOZ.)	*****	*****	*****		446.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.528E 07
% FUEL AS COAL	96.2
COAL FLOW RATE,#/HR	417.1
NAT.GAS FLOW,#/HR	9.1
% EXCESS AIR	20.0
OXYGEN,% DRY, MEAS.	4.20
CO2,% DRY-CALC.	14.43
HUMIDITY,#/# - CALC.	0.053

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	*****
LIQ/GAS,GAL/MCF	*****
LIQ/GAS,#/#	*****
PRES.DROP,IN.WG	*****

VENT ARS.

*****	99.37
*****	*****
*****	*****
*****	*****
*****	*****
*****	13.1
*****	31.9
*****	4.3
*****	6.5

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2 = 60.4
 SULFITE/SO2-MOL/MOL = 9.01
 SUMP RESID.TIME,MIN = 28.5

SULFATE FORMATION PARAMETERS

CONC.,GH-MOLE/L= 0.0688
 MOLT TOTAL SULF= 12.94
 O2 AT FURN.FX.= 4.20
 O2 AT ABSORB.IN= *****
 O2 AT ABSORB.EX= *****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-182

DATE 5-13-70

TIME OF DAY 0200

INPUT FOR EQ. - KIN. PROG.

MATERIAL BALANCES

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR
15.43
13.70

MAGNESIUM

FLYASH
30.87

WATER
266.2
285.7

DRY GAS
5387.
5394.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

13.70
11.86

11.39
9.10

1014.
1171.

4853.
5739.

FEED RATE, #/SEC = 1.57

ENTHALPY, BTU/# = -904.

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGD
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML
3.10
3.10
0.0
3.10
0.98
2.12
0.08
0.10
0.44
3.64

GM-MOLE/
LITER
0.4843
0.4843
0.0
0.4843
0.1531
0.3312
0.0062
0.0163
0.0688
0.5694

GRAM/
100ML

1.592
7.022
0.116
0.065
0.826

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = 10.50
MGD PRESLAKED, NO=0, YES=1
% SLAKED TO MG(DH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.80
SP. GRAVITY, HYDRON. = 1.0360

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-183	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST, H2O	0.7500E 01	N.G. FLOW, %SCALE	0.1000E 03
TIME	0500	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.8400E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.1500E 01	SCREW SPEED, RPM	0.3200E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1000E 01	02 FURN. EX. %DM	0.4000E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.5300E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.1500E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2892E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1250E 03	PART. SCRUB. IN	0.3950E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3950E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3350E 03
ABS ORIF. INCH	0.4600E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6150E 03	PRI. AIR FAN IN.	0.8400E 02
		NO. 2 BANK OUT	0.5400E 03	PRI. AIR WGT BULB	0.7100E 02
CARD NUMBER	7	FURN. EXIT	0.4450E 03	SEC. AIR FAN IN.	0.6400E 02
MODE OF OPER.	5	COAL-AIR	0.1100E 03	SEC. AIR WET BULB	0.6200E 02
PART. SCR. ST, HG	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.3000E 00
PART. CYC. DP, H2O	0.0	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3600E 01
#1 ORIF. ST, HG	0.1000E 00			FBA DP, H2O	0.6600E 01
#1 ORIF. DP, H2O	0.4800E 01			FBA DEMIST. DP, H2O	0.4000E 00
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4100E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3350E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1300E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1290E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4128E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O F1. GAL	0.4135E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.8600E 02	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1190E 03	MGOH2 TANK	0.1540E 03	MGO ROTO. SCALE, %	0.3200E 02
MGO SLAK TANK	0.8200E 02			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.1510E 03				
MAKEUP WATER	0.6000E 02				

DATE 5-13-70 TIME OF DAY 0500

RUN NUMBER M-183

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	479.	110.0	---	---	---	---	0.014	71.8	472.	17.6
SECONDARY AIR	4896.	741.3	---	---	---	---	0.013	68.4	4835.	7.5
FURNACE EXIT	5784.	445.0	2571.0	---	---	---	0.053	113.6	5491.	1.5
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	5126.	395.0	*****	*****	*****	*****	0.053	113.6	4866.	1.4
VENT.ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS.CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5126.	335.0	*****	*****	*****	*****	0.053	113.6	---	-4.1
FLOATING BED EX	6295.	130.0	*****	*****	*****	*****	0.091	129.5	---	-13.5
P.P. EXIT ORIF.	6295.	129.0	12.0	*****	*****	*****	0.091	129.5	5769.	-13.5

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP,F	FLOW,#/M	FRA	TEMP,F	FLOW,#/M
PARTICULATE	*****	*****	MAKEUP WATER	*****	*****	*****	60.0	9.9	9.9
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	*****	*****	6.4	151.0	4.2	4.2
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	*****	*****	134.0	16.9	16.9
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	*****	*****	*****	134.0	394.7	394.7
			REC.(FLOW NOZ.)	*****	*****	*****		446.1	446.1

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.543E 07
% FUEL AS COAL	96.3
COAL FLOW RATE,#/HR	429.8
NAT.GAS FLOW,#/HR	9.1
% EXCESS AIR	19.0
OXYGEN,% DRY, MEAS.	4.00
CO2,% DRY-CALC.	14.60
HUMIDITY,#/# - CALC.	0.053

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	*****
LIQ/GAS,GAL/MCF	*****
LIQ/GAS,#/#	*****
PRES.DROP,IN.WG	*****

VENT ABS.

*****	99.53
*****	*****
*****	*****
*****	*****
*****	13.1
*****	31.9
*****	4.3
*****	6.6

FLOAT.BED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	64.3
SULFITE/SO2-MOL/MOL	=	8.81
SUMP RESID.TIME,MIN	=	12.8

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0531
MOL% TOTAL SULF=	12.44
O2 AT FURN.EX.=	4.00
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-183 DATE 5-13-70 TIME OF DAY 0500 INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 15.90
 OUTPUT, #/HR 14.76

PART. SCRUBBER
 INPUT, #/HR *****
 OUTPUT, #/HR *****

SULFUR
 INPUT, #/HR 15.90
 OUTPUT, #/HR 14.76

MAGNESIUM
 INPUT, #/HR 15.90
 OUTPUT, #/HR 14.76

FLYASH
 INPUT, #/HR 31.80
 OUTPUT, #/HR *****

WATER
 INPUT, #/HR 273.8
 OUTPUT, #/HR 293.3

DRY GAS
 INPUT, #/HR 5483.
 OUTPUT, #/HR 5491.

SO2 ABSORBERS
 INPUT, #/HR 14.76
 OUTPUT, #/HR 14.32

SO2
 INPUT, #/HR 14.76
 OUTPUT, #/HR 14.32

* SO2 ABSORBERS -
 PRODUCT COMP.

TOTAL, 2.47
 COMBINED 2.47
 FREE 0.0
 MONO(TOTAL) 2.47
 MONO(DISSOLVED) 1.02
 MONO(SOLID) 1.45
 BISULFITE 0.12
 MGO 0.04
 SULFATE 0.34
 MAGNESIUM 2.85
 FLYASH
 SOLIDS, MG

GM SO2/
 100ML

GM-MOLE/
 LITER

GRAM/
 100ML

MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML = 9.40
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 6.80
 SP.GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-184	CARD NUMBER	3
DATE	5-13-70	N.G. FLOW, %SCALE	0.9800E 02
TIME	1000	N.G. STATIC, R.O.	0.9000E 01
PRI. AIR ST, HG	0.1200E 01	SCREW SPEED, RPM	0.3000E 03
PRI. AIR DP, H2O	0.2400E 01	02 FURN. EX. % - BM	0.5200E 01
SEC. AIR ST, HG	0.1200E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2891E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1200E 03	PART. SCRUB. IN	
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7400E 03	#1 CRIFICE	0.3800E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.3850E 03
ABS ORIF. INCH	0.4400E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.3200E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7300E 03	AIR HEATER #2	0.8500E 03
NANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI. AIR FAN IN.	0.8500E 03
		NO.2 BANK OUT	0.5200E 03	PRI. AIR WGT BULB	0.8700E 02
CARD NUMBER	7	FURN. EXIT	0.4300E 03	SEC. AIR FAN IN.	0.7400E 02
MODE OF OPER.	5	COAL-AIR	0.1200E 03	SEC. AIR FAN IN.	0.6900E 02
PART. SCR. ST, HG	0.0			SEC. AIR WGT BULB	0.6700E 02
PART. SCR. DP, H2O	0.0				
PART. CYC. DP, H2O	0.0				
#1 ORIF. ST, HG	0.2000E 00				
#1 CRIF. DP, H2O	0.5000E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.6000E 00
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3200E 01
		FBA DP, H2O	0.6400E 01
		FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1280E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4187E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O FI. GAL	0.4198E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1760E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1280E 03	MGO2 TANK	0.1050E 03	MGO ROTO. SCALE, %	0.2300E 02
MGO SLAK TANK	0.1740E 03			MAKEUP SETTING	0.2300E 02
MGO2 TANK	0.1000E 03				
MAKEUP WATER	0.6200E 02				

TIME OF DAY 1000

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	495.	120.0	---	---	---	---	0.016	75.4	487.	16.3
SECONDARY AIR	4888.	727.5	---	---	---	---	0.015	73.3	4816.	6.0
FURNACE EXIT	5764.	430.0	2814.9	11.4	750.	*****	0.053	113.4	5473.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	5261.	385.0	*****	*****	*****	*****	0.053	113.4	4995.	2.7
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5261.	320.0	*****	*****	*****	*****	0.053	113.4	---	-8.1
FLOATING BED EX	6387.	128.0	*****	*****	*****	*****	0.089	128.2	---	-16.3
P.P. EXIT ORIF.	6387.	128.0	8.4	*****	762.	*****	0.089	128.2	5866.	-16.3

SCRUBBER STREAM DATA

RUBBER STREAM DATA	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	***	***	MAKEUP WATER	***	TEMP, F
MAKEUP WATER	***	***	MAKEUP MGO SL.	***	FLOW, #/M
PRODUCT LIQ.	***	***	PRODUCT LIQ.	***	14.9
RECIRCULATED LIQ.	***	***	REC. (SPRAY NOZ.)	***	3.5
			REC. (FLOW NOZ.)	***	16.9
				***	394.7
				***	436.3

FURNACE PERFORMANCE

BURNACE PERFORMANCE		SCRUBBER PERFORMANCE		PART.	VENT ABS.	FLOAT,RED
HEAT RELEASE,BTU/HR	0.505E 07	S02 ABSORB.EFF	**	**	**	99.70
% FUEL AS COAL	96.1	FLYASH COL.EFF	**	**	**	**
COAL FLOW RATE,#/HR	398.9	S03 ABSORB.EFF	**	**	**	**
NAT.GAS FLOW,#/HR	8.9	NOX ABSORB.EFF	**	**	**	-1.57
% EXCESS AIR	24.8	GAS VELOCITY,FPS	**	**	**	13.4
OXYGEN,% DRY, MEAS.	5.20	LIQ/GAS,GAL/MCF	**	**	**	30.6
CO2,% DRY-CALC.	13.55	LIQ/GAS, #/#	**	**	**	4.1
HUMIDITY, #/# - CALC.	0.053	PRES.DROP, IN.WG	**	**	**	6.4

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

```
*****  
*****  
*****  
*****  
*****
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KGA,#MOLE/HR-FT2,	=
SULFITE/SO2-MOL/MOL	=
SUMP RESID.TIME,MIN	=

SULFATE FORMATION PARAMETERS

FLOATING BED ABSORBER

CONC., GM-MOLE/L =	0.0619
MOL% TOTAL SULF =	11.19
O2 AT FURN. EX. =	5.20
O2 AT ABSORB. IN =	*****
O2 AT ABSORB. EX =	*****

	MEANS	ITEM NOT MEASURED
1	0.78	0.96
2	0.78	0.96
3	0.78	0.96
4	0.78	0.96
5	0.78	0.96
6	0.78	0.96
7	0.78	0.96
8	0.78	0.96
9	0.78	0.96
10	0.78	0.96
11	0.78	0.96
12	0.78	0.96
13	0.78	0.96
14	0.78	0.96
15	0.78	0.96
16	0.78	0.96
17	0.78	0.96
18	0.78	0.96
19	0.78	0.96
20	0.78	0.96
21	0.78	0.96
22	0.78	0.96
23	0.78	0.96
24	0.78	0.96
25	0.78	0.96
26	0.78	0.96
27	0.78	0.96
28	0.78	0.96
29	0.78	0.96
30	0.78	0.96
31	0.78	0.96
32	0.78	0.96
33	0.78	0.96
34	0.78	0.96
35	0.78	0.96
36	0.78	0.96
37	0.78	0.96
38	0.78	0.96
39	0.78	0.96
40	0.78	0.96
41	0.78	0.96
42	0.78	0.96
43	0.78	0.96
44	0.78	0.96
45	0.78	0.96
46	0.78	0.96
47	0.78	0.96
48	0.78	0.96
49	0.78	0.96
50	0.78	0.96
51	0.78	0.96
52	0.78	0.96
53	0.78	0.96
54	0.78	0.96
55	0.78	0.96
56	0.78	0.96
57	0.78	0.96
58	0.78	0.96
59	0.78	0.96
60	0.78	0.96
61	0.78	0.96
62	0.78	0.96
63	0.78	0.96
64	0.78	0.96
65	0.78	0.96
66	0.78	0.96
67	0.78	0.96
68	0.78	0.96
69	0.78	0.96
70	0.78	0.96
71	0.78	0.96
72	0.78	0.96
73	0.78	0.96
74	0.78	0.96
75	0.78	0.96
76	0.78	0.96
77	0.78	0.96
78	0.78	0.96
79	0.78	0.96
80	0.78	0.96
81	0.78	0.96
82	0.78	0.96
83	0.78	0.96
84	0.78	0.96
85	0.78	0.96
86	0.78	0.96
87	0.78	0.96
88	0.78	0.96
89	0.78	0.96
90	0.78	0.96
91	0.78	0.96
92	0.78	0.96
93	0.78	0.96
94	0.78	0.96
95	0.78	0.96
96	0.78	0.96
97	0.78	0.96
98	0.78	0.96
99	0.78	0.96
100	0.78	0.96

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-184

DATE 5-13-70

TIME OF DAY 1000

INPUT FOR EQ. - KIN. PROG.

MATERIAL BALANCES

FURNACE

INPUT, #/HR
OUTPUT, #/HR

14.76
16.18

29.52

WATER

271.6
290.8

FLYASH

29.52

DRY GAS

5466.
5473.

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.425769
HYDROGEN 0.575597
OXYGEN 1.399107
NITROGEN 5.094021
SULFUR 0.008077

PART. SCRUBBER

INPUT, #/HR
OUTPUT, #/HR

FEED RATE, #/SEC = 1.59

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

1355.
1474.

4995.
5866.

ENTHALPY, BTU/# = -1845.

* SO2 ABSORBERS -
PRODUCT COMP.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 8.10
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

3.27
3.08
0.19
2.89
1.12
1.77
0.40
0.0
0.40
3.48

0.5103
0.4812
0.0291
0.4522
0.1750
0.2772
0.0313
0.0
0.0619
0.5432

1.820
5.876
0.581
0.0
0.743

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.60
SP. GRAVITY, HYDRUM. = 1.0420

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-185	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, RSCALE	0.9800E 02
TIME	1130	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.9200E 01
PRI. AIR ST, HG	0.1100E 01	FURN. ST, H2O	0.1000E 01	SCREW SPEED, RPM	0.3000E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1200E 01	O2 FURN. EX. S-RM	0.5800E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5500E 01	CUMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.1400E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P-SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2892E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR GRIF.	0.1200E 03	PART. SCRUB. IN	0.0
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3900E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7500E 03	FBA INLET	0.3200E 03
ABS ORIF. INCH	0.4300E 01	WINDBOX-BOT.	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI. AIR FAN IN.	0.8800E 02
		NO.2 BANK OUT	0.5200E 03	PRI. AIR WGT BULB	0.7400E 02
CARD NUMBER	7	FURN. EXIT	0.4300E 03	SEC. AIR FAN IN.	0.6700E 02
MODE OF OPER.	5	COAL-AIR	0.1250E 03	SEC. AIR WET BULB	0.6600E 02

PART. SCR. ST, HG	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.6000E 00
PART. CYC. DP, H2O	0.0	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3800E 01
#1 ORIF. ST, HG	0.2000E 00			FBA DP, H2O	0.6400E 01
#1 ORIF. DP, H2O	0.5000E 01			FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4100E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1280E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4198E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1320E 03	ABS H2O FI. GAL	0.4209E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.6500E 02
FBA SUMP	0.1270E 03	MGOH2 TANK	0.1500E 03	MGO ROTO. SCALE, %	0.2300E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.2300E 02
MGGH2 TANK	0.1460E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER		M-185		DATE 5-13-70		TIME OF DAY 1130						
FLUE GAS DATA												
	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O		
PRIMARY AIR	492.	125.0	----	----	----	----	0.016	75.0	484.	14.9		
SECONDARY AIR	4889.	752.5	----	----	----	----	0.015	72.7	4819.	6.0		
FURNACE EXIT	5748.	430.0	2281.1	*****	*****	*****	0.052	112.3	5466.	1.4		
PART. SCRUB. INLET	*****	*****	*****	*****	*****	*****	*****	*****	----	*****		
PART. CYC. EXIT	5244.	390.0	*****	*****	*****	*****	0.052	112.4	4987.	2.7		
VENT ABS. INLET	*****	*****	*****	*****	*****	*****	*****	*****	----	*****		
ABS CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	*****	----	*****		
FLOATING BED IN	5244.	320.0	*****	*****	*****	*****	0.052	112.4	----	-8.1		
FLOATING BED EX	6383.	128.0	*****	*****	*****	*****	0.089	128.2	----	-16.3		
P.P. EXIT ORIF.	6383.	128.0	5.5	*****	*****	*****	0.089	128.2	5862.	-16.3		

SCRUBBER STREAM DATA

PARTICULATE		TEMP, F		FLOW, GPM		GAS ABSORBER		VENTURI ABSORBER		FRA	
MAKEUP WATER	PRODUCT LIQ.	*****	*****	*****	*****	MAKEUP WATER	*****	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
RECIRCULATED LIQ.	*****	*****	*****	*****	*****	MAKEUP MGO SL.	*****	*****	*****	62.0	14.4
	*****	*****	*****	*****	*****	PRODUCT LIQ.	*****	*****	*****	146.0	3.5
	*****	*****	*****	*****	*****	REC. (SPRAY NOZ)	*****	*****	*****	132.0	16.9
	*****	*****	*****	*****	*****	REC. (FLOW NOZ.)	*****	*****	*****	132.0	394.7
	*****	*****	*****	*****	*****		*****	*****	*****		431.3

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.486E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLOAT. BED
% FUEL AS COAL	96.0	SO2 ABSORB. EFF	*****	*****	99.76
COAL FLOW RATE, #/HR	383.5	FLYASH COL. EFF	*****	*****	*****
NAT. GAS FLOW, #/HR	8.9	SO3 ABSORB. EFF	*****	*****	*****
% EXCESS AIR	27.6	NOX ABSORB. EFF	*****	*****	*****
OXYGEN, % DRY, MEAS.	5.80	GAS VELOCITY, FPS	*****	*****	13.4
CO2, % DRY-CALC.	13.04	LIQ/GAS, GAL/MCF	*****	*****	30.2
HUMIDITY, #/100 - CALC.	0.052	LIQ/GAS, #/100	*****	*****	4.1
		PRES. DROP, IN. WG	*****	*****	6.4

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, # MOLE/HR-FT2,	=	*****	FLOATING BED ABSORBER
SULFITE/SO2-MOL/MOL	=	*****	
SUMP RESID. TIME, MIN	=	*****	
***** MEANS ITEM NOT MEASURED			

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L=	0.0575
MOL% TOTAL SULF=	12.14
O2 AT FURN. EX.=	5.80
O2 AT ABSORB. IN=	*****
O2 AT ABSORB. EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-185

DATE 5-13-70

TIME OF DAY 1130

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE
INPUT, #/HR 14.19
OUTPUT, #/HR 13.12

PART. SCRUBBER
INPUT, #/HR *****
OUTPUT, #/HR *****

SULFUR
14.19
13.12

MAGNESIUM

FLYASH
28.38

WATER
262.6
281.8

DRY GAS
5460.
5466.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.410781
HYDROGEN 0.561203
OXYGEN 1.400254
NITROGEN 5.107821
SULFUR 0.007785

FEED RATE, #/SEC = 1.58

ENTHALPY, BTU/# = -711.

SO2 ABSORBERS
INPUT, #/HR 13.12
OUTPUT, #/HR 16.07

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 2.79
COMBINED 2.73
FREE 0.06
MONO(TOTAL) 2.66
MONO(DISSOLVED) 1.02
MONO(SOLID) 1.64
BISULFITE 0.08
MGO 0.0
SULFATE 0.37
MAGNESIUM 3.10
FLYASH -----
SOLIDS, MG -----

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGO/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.50
SP.GRAVITY, HYDROM. = 1.0330

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-186	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST,H2O	0.6500E 01	N.G. FLOW,%SCALE	0.9800E 02
TIME	1300	BURNER DP,H2O	0.6400E 01	N.G. STATIC,R.O.	0.9200E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2100E 01	SCREW SPEED,RPM	0.3000E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.1200E 01	02 FURN.EX,%-BM	0.5400E 01
SEC.AIR ST,HG	0.1200E 01	PP EXIT DP,H2O	0.5500E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2400E 01	FURN.EX,ST,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2892E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR GRIF.	0.1200E 03	PART.SCRUB.IN	
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.4000E 03
ABS LOAD,PSIG	0.5200E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.4000E 03
ABS ORIF.INCH	0.4200E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.3000E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6200E 03	PRI.AIR FAN IN.	0.8500E 03
		NO.2 BANK OUT	0.5400E 03	PRI.AIR WGT BULB	0.9200E 02
CARD NUMBER	7	FURN. EXIT	0.4400E 03	SEC.AIR FAN IN.	0.7600E 02
MODE OF OPER.	5	COAL-AIR	0.1300E 03	SEC.AIR FAN IN.	0.7300E 02
PART.SCR.ST,HG	0.0			SEC.AIR WET BULB	0.7000E 02
PART.SCR.DP,H2O	0.0				
PART.CYC.DP,H2O	0.0				
#1 ORIF.ST,HG	0.2000E 00				
#1 ORIF.DP,H2O	0.5000E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.6000E 00
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.4400E 01
		FBA DP,H2O	0.6400E 01
		FBA DEMIST.DP,H2O	0.8000E 00

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3500E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1280E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.4209E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1330E 03	ABS H2O FI,GAL	0.4220E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1000E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1250E 03	MGOH2 TANK	0.1440E 03	MGO ROTO.SCALE,%	0.2300E 02
MGO SLAK TANK	0.1020E 03			MAKEUP SETTING	0.2300E 02
MGOH2 TANK	0.1420E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-186

DATE 5-13-70

TIME OF DAY 1300

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SU3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	491.	130.0	---	---	---	---	0.017	76.6	483.	16.3
SECONDARY AIR	4897.	747.5	---	---	---	---	0.016	76.1	4808.	6.5
FURNACE EXIT	5752.	440.0	2324.3	---	766.	1.9907	0.054	113.9	5457.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	5213.	400.0	*****	*****	*****	*****	0.054	113.9	4945.	2.7
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5213.	300.0	*****	*****	*****	*****	0.054	113.9	---	-8.1
FLOATING BED EX	6389.	128.0	*****	*****	*****	*****	0.090	128.7	---	-16.3
P.P. EXIT ORIF.	6389.	127.0	3.8	*****	*****	0.0816	0.090	128.7	5861.	-16.3

SCRUBBER STREAM DATA

	TEMP.,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP.,F	FLOW,#/M	TEMP.,F	FLOW,#/M
PARTICULATE	*****	*****	MAKEUP WATER	*****	*****	*****	62.0	14.5
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	*****	6.4	*****	142.0	3.5
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	*****	*****	133.0	14.3
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ.)	*****	*****	*****	133.0	394.7
			REC.(FLOW NOZ.)	*****	*****	*****		426.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.498E 07
% FUEL AS COAL	96.1
COAL FLOW RATE,#/HR	392.8
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	25.7
OXYGEN,% DRY, MEAS.	5.40
CO2,% DRY-CALC.	13.38
HUMIDITY,#/# - CALC.	0.054

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	*****
LIQ/GAS,GAL/MCF	*****
LIQ/GAS,#/#	*****
PRES.DROP,IN.WG	*****

VENT ABS.

*****	99.84
*****	95.90
*****	*****
*****	*****
*****	13.4
*****	29.8
*****	4.0
*****	6.4

FLOAT.BED

*****	99.84
*****	95.90
*****	*****
*****	*****
*****	13.4
*****	29.8
*****	4.0
*****	6.4

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	78.5
SULFITE/SO2-MOL/MOL	=	9.66
SUMP RESID.TIME,MIN	=	16.9

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0541
MOL% TOTAL SULF=	13.85
O2 AT FURN.EX=	5.40
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-186

DATE 5-13-70

TIME OF DAY 1300

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.420768
 HYDROGEN 0.578281
 OXYGEN 1.399687
 NITROGEN 5.098627
 SULFUR 0.007979

FURNACE
 INPUT, #/HR 14.53
 OUTPUT, #/HR 13.33

PART. SCRUBBER

INPUT, #/HR
 OUTPUT, #/HR

SO2 ABSORBERS

INPUT, #/HR 13.33
 OUTPUT, #/HR 10.96

FEED RATE, #/SEC = 1.58

ENTHALPY, BTU/# = -1903.

*

*SO2 ABSORBERS- PRODUCT COMP.

TOTAL, 2.20
 COMBINED 2.16
 FREE 0.04
 MONO(TOTAL) 2.12
 MONO(DISSOLVED) 1.08
 MONO(SOLID) 1.04
 BISULFITE 0.20
 MGO 0.0
 SULFATE 0.35
 MAGNESIUM 2.51
 FLYASH
 SOLIDS, MG

GM-MOLE/
 LITER

GRAM/
 100ML

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.20
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.80
 SP. GRAVITY, HYDROM. = 1.0300

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =
 FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-187	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST, H2O	0.7000E 01	N.G. FLOW, %SCALE	0.9000E 02
TIME	1430	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.9000E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.3000E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1600E 01	02 FURN. EX. % - BM	0.5500E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5800E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2890E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1300E 03	PART. SCRUB. IN	0.4000E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.4000E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.3000E 03
ABS ORIF. INCH	0.4400E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.3500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6200E 03	PRI. AIR FAN IN.	0.9000E 02
		NO.2 BANK OUT	0.5400E 03	PRI. AIR WGT BULB	0.7500E 02
CARD NUMBER	7	FURN. EXIT	0.4450E 03	SEC. AIR FAN IN.	0.6800E 02
MODE OF OPER.	5	COAL-AIR	0.1100E 03	SEC. AIR WET BULB	0.6700E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.4000E 00
#1 ORIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.5000E 01
#1 ORIF. DP, H2O	0.5000E 01			FBA DP, H2O	0.6200E 01
				FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.0	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.0	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1280E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4220E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O FI. GAL	0.4237E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1700E 03	ABS H2O TIME, MIN	0.9000E 02
FBA SUMP	0.1240E 03	MGOH2 TANK	0.1400E 03	NGO ROTO. SCALE, %	0.3100E 02
MGO SLAK TANK	0.1680E 03			MAKEUP SETTING	0.3100E 02
MGOH2 TANK	0.1370E 03				
MAKEUP WATER	0.6200E 02				

RUN NUMBER M-167

DATE 5-13-70

TIME OF DAY 1430

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	459.	110.0	---	---	---	---	0.016	75.8	491.	16.3
SECONDARY AIR	4845.	747.5	---	---	---	---	0.015	73.7	4773.	7.0
FURNACE EXIT	5715.	445.0	2695.6	---	---	---	0.053	113.1	5429.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	5203.	400.0	*****	*****	*****	*****	0.053	113.0	4942.	1.4
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5203.	300.0	*****	*****	*****	*****	0.053	113.0	---	-5.4
FLOATING BED EX	6512.	128.0	*****	*****	*****	*****	0.086	126.6	---	-21.7
P.P. EXIT GRIF.	6512.	128.0	7.1	*****	*****	*****	0.086	126.6	5996.	-21.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP,F FLOW,#/M	FDA TEMP,F FLOW,#/M
PARTICULATE	*****	*****	*****	*****	16.3
MAKEUP WATER	*****	*****	MAKEUP MGD SL.	6.4	4.1
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	16.9
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ.)	*****	394.7
			REC.(FLOW NOZ.)	*****	436.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.492E 07
FUEL AS COAL	96.0
COAL FLOW RATE,#/HR	388.2
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	26.2
OXYGEN,%DRY,MEAS.	5.50
CO2,%DRY-CALC.	13.30
HUMIDITY,#/# - CALC.	0.053

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	*****
LIQ/GAS,GAL/MCF	*****
LIQ/GAS,#/#	*****
PRES.DROP,IN.WG	*****

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

***** MEANS ITEM NOT MEASURED

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	74.3
SULFITE/SO2-MOL/MOL	=	8.33
SUMP RESID.TIME,MIN	=	15.7

SULFATE FORMATION PARAMETERS

CUNC.,GM-MOLE/L=	0.0497
MOL% TOTAL SULF=	11.47
O2 AT FURN.EX.=	5.50
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

VENT ABS.

*****	99.74
*****	*****
*****	*****
*****	*****
*****	13.8
*****	29.6
*****	4.0
*****	6.2

FLOAT.BED

*****	99.74
*****	*****
*****	*****
*****	*****
*****	13.8
*****	29.6
*****	4.0
*****	6.2

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-187 DATE 5-13-70 TIME OF DAY 1430

MATERIAL BALANCES

FURNACE

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.36	28.73	267.0	5423.
OUTPUT, #/HR	15.39	*****	286.2	5429.

PART. SCRUBBER

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	*****	*****	*****	*****
OUTPUT, #/HR	*****	*****	*****	*****

SO2 ABSORBERS

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	15.39	*****	1484.	4942.
OUTPUT, #/HR	14.47	*****	1483.	5996.

INPUT FLOWS, #/100#FEED

CARBON	0.418250
HYDROGEN	0.571727
OXYGEN	1.399976
NITROGEN	5.100946
SULFUR	0.007929

FEED RATE, #/SEC = 1.57

ENTHALPY, BTU/# = -1339.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = *****

MGO PRESLAKED, ND=0, YES=1 *****

% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.60

SP. GRAVITY, HYDROM. = 1.0380

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****

FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-188	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST, H2O	0.8000E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1600	BURNER DP, H2O	0.6200E 01	N.G. STATIC, R.O.	0.9200E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.2000E 01	SCRUB SPEED, RPM	0.3000E 03
PRI. AIR DP, H2O	0.2300E 01	PP EXIT ST, HG	-0.1000E 01	O2 FURN. EX. %BM	0.5800E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5400E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2400E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BARGMETRIC, HG	0.2892E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1300E 03	PART. SCRUB. IN	0.3900E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7500E 03	#1 ORIFICE	0.4100E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3300E 03
ABS ORIF. INCH	0.4200E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6300E 03	PRI. AIR FAN IN.	0.9000E 02
		NO.2 BANK OUT	0.5400E 03	PRI. AIR WGT BULB	0.7500E 02
CARD NUMBER	7	FURN. EXIT	0.4400E 03	SEC. AIR FAN IN.	0.6900E 02
MODE OF OPER.	5	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.6700E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0				
PART. CYC. DP, H2O	0.0				
#1 ORIF. ST, HG	0.2000E 00				
#1 ORIF. DP, H2O	0.5000E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.3000E 00
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.6000E 01
		FBA DP, H2O	0.6000E 01
		FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1300E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1300E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4237E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1340E 03	ABS H2O FI. GAL	0.4249E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1700E 03	ABS H2O TIME, MIN	0.6800E 02
FBA SUMP	0.1230E 03	MGOH2 TANK	0.1420E 03	MGO ROTO. SCALE, %	0.3800E 02
MGO SLAK TANK	0.1680E 03			MAKEUP SETTING	0.3800E 02
MGOH2 TANK	0.1340E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-188

DATE 5-13-70

TIME OF DAY 1600

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	485.	120.0	---	---	---	---	0.016	75.8	477.	16.3
SECONDARY AIR	4847.	737.5	---	---	---	---	0.015	73.7	4774.	8.0
FURNACE EXIT	5654.	440.0	2628.2	6.3	---	---	0.052	112.7	5412.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	5182.	410.0	*****	*****	*****	*****	0.052	112.7	4926.	2.7
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5182.	330.0	*****	*****	*****	*****	0.052	112.7	---	-4.1
FLOATING BED EX	6330.	130.0	*****	*****	*****	*****	0.092	129.6	---	-13.5
P.P. EXIT ORIF.	6330.	130.0	7.2	*****	*****	*****	0.092	129.6	5796.	-13.5

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	*****	*****	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	*****	*****	MAKEUP MGD SL.	*****	62.0 15.0
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	134.0 4.6
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ.)	*****	134.0 16.9
			REC.(FLOW NOZ.)	*****	134.0 394.7
				*****	426.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.482E 07
% FUEL AS CGAL	95.9
COAL FLOW RATE,#/HR	379.6
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	27.6.
OXYGEN,% DRY, MEAS.	5.80
CO2,% DRY-CALC.	13.03
HUMIDITY,#/# - CALC.	0.052

SCRUBBER PERFORMANCE

	PART.
SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	*****
LIQ/GAS,GAL/MCF	*****
LIQ/GAS,#/#	*****
PRES.DROP,IN.WG	*****

VENT ABS.

99.73

13.2
30.1
4.0
6.0

FLOAT.RED

99.73

13.2
30.1
4.0
6.0

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	71.5
SULFITE/SO2-MOL/MOL	=	9.10
SUMP RESID.TIME,MIN	=	18.6

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0497
MOL% TOTAL SULF=	9.79
O2 AT FURN.EX.=	5.80
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

***** MEANS ITEM NOT MEASURED

TIME OF DAY 1600

RUN NUMBER M-188

DATE 5-13-70

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
--------	-----------	--------	-------	---------

INPUT FLOWS, #ATOMS/100#FEED

CARBON 0.410726

HYDROGEN 0.565219

1.400848

NITROGEN 5-107875

SUI EUR 0-007782

FEED RATE, #/SEC= 1.57

ENTHALPY, BTU/H = -1331.

***	1433.	4926.
***	1491.	5796.

14.97	*****
17.12	13.30

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
------------------	-------------------	----------------

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGU/100ML = *****

MGO PRESLAKED, NU=0, YES=1

% SLAKED TO NG(OH)2, MEAS. =

[illegible]

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH. PH = 7.70

SP-GRAVITY, HYDRUM. = 1.0330

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = ****

FLYASH CONC. GM/100ML = ****

COAL COMPOSITION-MASS

CARBON 0.7150

HYDROGEN 0.0485

CXY+NIT	0.0817
---------	--------

SULFUR 0.0370

ASH 0.0740

0.0438
WATER

*
* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	M-189	CARD NUMBER	3
DATE	5-13-70	N.G. FLOW, %SCALE	0.9900E 02
TIME	2030	N.G. STATIC, R.O.	0.9000E 01
PRI. AIR ST, HG	0.1300E 01	SCREW SPEED, RPM	0.2800E 03
PRI. AIR DP, H2O	0.2300E 01	O2 FURN. EX. % - BM	0.5400E 01
SEC. AIR ST, HG	0.1500E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2200E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BARGMETRIC, HG	0.2888E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1250E 03	PART. SCRUB. IN	0.3800E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3900E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3400E 03
ABS ORIF. INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.5950E 03	PRI. AIR FAN IN.	0.8800E 02
		NO. 2 BANK OUT	0.5100E 03	PRI. AIR WGT BULB	0.7400E 02
CARD NUMBER	7	FURN. EXIT	0.4200E 03	SEC. AIR FAN IN.	0.6800E 02
MODE OF OPER.	5	COAL-AIR	0.1200E 03	SEC. AIR WGT BULB	0.6600E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0				
PART. CYC. DP, H2O	0.0				
#1 ORIF. ST, HG	0.1000E 00				
#1 ORIF. DP, H2O	0.4600E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.3000E 00
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.2000E 01
		FBA DP, H2O	0.6000E 01
		FBA DEMIST. DP, H2O	0.8000E 00

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.3900E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3400E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1290E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1290E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4303E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1330E 03	ABS H2O FI. GAL	0.4314E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1540E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1240E 03	MGOH2 TANK	0.1220E 03	MGO ROTU. SCALE, %	0.4200E 02
MGO SLAK TANK	0.1490E 03			MAKEUP SETTING	0.4200E 02
MGOH2 TANK	0.1170E 03				
MAKEUP WATER	0.6600E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-189

DATE 5-13-70

TIME OF DAY 2030

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 13.96
 OUTPUT, #/HR 13.58
 Sulfur 13.96
 MAGNESIUM 27.93
 FLYASH 255.7
 WATER 5246.
 DRY GAS 5252.
 PART-SCRUBBER
 INPUT, #/HR
 OUTPUT, #/HR
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.420497
 HYDROGEN 0.569960
 OXYGEN 1.399663
 NITROGEN 5.098891
 SULFUR 0.007965

FEED RATE, #/SEC = 1.52

ENTHALPY, BTU/# = -1192.

SO2 ABSORBERS

INPUT, #/HR 13.58
 OUTPUT, #/HR 10.37
 GM SO2/ 100ML 17.07
 GM-MOLE/ LITER 9.19

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL, 1.93
 COMBINED 1.93
 FREE 0.0
 MONO(TOTAL) 1.93
 MONO(DISSOLVED) 1.06
 MONO(SOLID) 0.87
 BISULFITE 0.0
 MGO 0.41
 SULFATE 0.26
 MAGNESIUM 2.60
 FLYASH
 SOLIDS, MG
 MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGO/100ML = 9.60
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH =
 SP.GRAVITY, HYDROM. =

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =
 FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0317
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION
 * KIN. PROG.

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-190	CARD NUMBER	2	CARD NUMBER	3
DATE	5-13-70	WINDBOX ST, H2O	0.8800E 01	N.G. FLOW, %SCALE	0.1000E 03
TIME	2300	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.9000E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.3000E 01	SCREW SPEED, RPM	0.3000E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.8000E 00	D2 FURN. EX. % - BM	0.5600E 01
SEC. AIR ST, HG	0.1500E 01	PP EXIT DP, H2O	0.4700E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.3000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2890E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1200E 03	PART. SCRUB. IN	0.3750E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3800E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7250E 03	FBA INLET	0.3400E 03
ABS ORIF. INCH	0.4600E 01	WINDBOX-BOT.	0.7250E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6100E 03	PRI. AIR FAN IN.	0.8000E 02
		NO. 2 BANK OUT	0.5250E 03	PRI. AIR WGT BULB	0.7000E 02
CARD NUMBER	7	FURN. EXIT	0.4250E 03	SEC. AIR FAN IN.	0.6000E 02
MODE OF OPER.	5	COAL-AIR	0.1000E 03	SEC. AIR WGT BULB	0.6000E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0				
PART. CYC. DP, H2O	0.0				
#1 ORIF. ST, HG	0.1000E 00				
#1 ORIF. DP, H2O	0.4500E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.2000E 00
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.2000E 01
		FBA DP, H2O	0.6000E 01
		FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.3800E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3400E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1280E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4329E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1320E 03	ABS H2O FI. GAL	0.4336E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.7200E 02	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1220E 03	MGOH2 TANK	0.1540E 03	MGO ROTO. SCALE, %	0.4000E 02
MGO SLAK TANK	0.7100E 02			MAKEUP SETTING	0.4000E 02
MGOH2 TANK	0.1520E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-190

DATE 5-13-70

TIME OF DAY 2300

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.

FURNACE
INPUT, #/HR
OUTPUT, #/HR

SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
14.17	-----	28.33	248.2	5388.
14.86	-----	*****	267.8	5393.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

*****	-----	*****	*****	*****
*****	-----	*****	*****	*****

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

14.86	16.38	*****	1084.	4762.
12.97	11.37	*****	1357.	5433.

*#SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
------------------	-------------------	----------------

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGO
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

2.53	0.3952	-----
2.53	0.3952	-----
0.0	0.0	-----
2.53	0.3952	-----
1.04	0.1625	1.690
1.49	0.2327	4.934
0.0	0.0	0.0
0.49	0.0771	0.308
0.34	0.0531	0.637
3.36	0.5254	-----
-----	-----	*****
-----	-----	*****

MAKEUP MGO COMPOSITION

SLURRY CONC.- GM MGO/100ML = 9.50
MGO PRESLAKED, NU=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.50
SP.GRAVITY, HYDROM. = 1.0560

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*#SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

FEED RATE, #/SEC = 1.56

ENTHALPY, BTU/# = 39.

INPUT FLOWS, #ATONS/100#FEED
CARBON 0.415600
HYDROGEN 0.549347
OXYGEN 1.400254
NITROGEN 5.103395
SULFUR 0.007873

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-191	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST,H2O	0.9200E 01	N.G. FLOW,%SCALE	0.1000E 03
TIME	0130	BURNER DP,H2O	0.5800E 01	N.G. STATIC,R.O.	0.9000E 01
PRI.AIR ST,HG	0.1300E 01	FURN. ST,H2O	0.4000E 01	SCREW SPEED,RPM	0.3000E 03
PRI.AIR DP,H2O	0.2000E 01	PP EXIT ST,HG	-0.8000E 00	D2 FURN.EX,%-BM	0.5400E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.4600E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX,ST,H2O	0.4000E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2892E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F	0.1150E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR DRIF.	0.7600E 03	PART.SCRUB.IN	0.3800E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7300E 03	#1 DRIFICE	0.3750E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3400E 03
ABS DRIF.INCH	0.4600E 01	WINDBOX-ROT.	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.6000E 03	AIR HEATER #2	0.8500E 03
MANUMETER CODE	0	NO.1 BANK OUT	0.5200E 03	PRI.AIR FAN IN.	0.8000E 02
		NO.2 BANK OUT	0.4250E 03	PRI.AIR WGT BULB	0.6800E 02
CARD NUMBER	7	FURN. EXIT	0.1100E 03	SEC.AIR FAN IN.	0.5400E 02
MODE OF OPER.	5	CCAL-AIR		SEC.AIR WET BULB	0.5300E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.0	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.2000E 00
#1 DRIF.ST,HG	0.1500E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.3000E 01
#1 DRIF.DP,H2O	0.4600E 01			FBA DP,H2O	0.5200E 01
				FBA DEMIST.DP,H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 DRIFICE	0.3750E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3400E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1270E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.4358E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1320E 03	ABS H2O FI,GAL	0.4366E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.2000E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1270E 03	MGOH2 TANK	0.1360E 03	MGO ROTO.SCALE,%	0.2800E 02
MGO SLAK TANK	0.1970E 03			MAKEUP SETTING	0.2800E 02
MGOH2 TANK	0.1340E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-191

DATE 5-14-70

TIME OF DAY 0130

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	457.	110.0	---	---	---	---	0.013	68.7	451.	17.6
SECONDARY AIR	4847.	742.5	---	---	---	---	0.009	59.7	4802.	9.2
FURNACE EXIT	5676.	425.0	2775.6	---	---	---	0.047	109.8	5419.	4.0
PART. SCRUB. INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART. CYC. EXIT	5080.	375.0	*****	*****	*****	*****	0.047	109.7	4850.	2.0
VENT ABS. INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5080.	340.0	*****	*****	*****	*****	0.047	109.7	---	-2.7
FLOATING BED EX	5885.	127.0	*****	*****	*****	*****	0.090	129.3	---	-10.8
P.P. EXIT ORIF.	5885.	127.0	20.8	*****	*****	*****	0.090	129.3	5397.	-10.8

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP, F	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
PARTICULATE	*****	*****	*****	*****	*****	*****	*****	*****
MAKEUP WATER	*****	*****	*****	*****	*****	*****	*****	*****
PRODUCT LIQ.	*****	*****	*****	*****	*****	*****	*****	*****
RECIRCULATED LIQ.	*****	*****	*****	*****	*****	*****	*****	*****

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.494E 07
% FUEL AS COAL	95.9
COAL FLOW RATE, #/HR	389.6
NAT. GAS FLOW, #/HR	9.1
% EXCESS AIR	25.7
OXYGEN, % DRY, MEAS.	5.40
CO2, % DRY-CALC.	13.38
HUMIDITY, #/# - CALC.	0.047

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID. TIME, MIN = *****
 ***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	*****
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	*****
LIQ/GAS, GAL/MCF	*****
LIQ/GAS, #/#	*****
PRES. DROP, IN. WG	*****

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2 = 55.1
 SULFITE/SO2-MOL/MOL = 9.70
 SUMP RESID. TIME, MIN = 12.5

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L = 0.0659
 MOL% TOTAL SULF = 13.81
 O2 AT FURN. EX. = 5.40
 O2 AT ABSORB. IN = *****
 O2 AT ABSORB. EX = *****

TIME OF DAY 0130

MATERIAL BALANCES

FURNACE

INPUT, #/HR	14.42
OUTPUT, #/HR*	15.81

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

*SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,	2.70
COMBINED	2.49
FREE	0.20
MONO(TOTAL)	2.29
MONO(DISSOLVED)	1.14
MONO(SOLID)	1.15
DISULFITE	0.52
MCO	0.0
SULFATE	0.42
MAGNESIUM	2.91
FLYASH	---
SOLIDS,MG	---

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

* **SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #ATOMS/100#FEED	
CARBON	0.420617
HYDROGEN	0.538189
OXYGEN	1.399673
NITROGEN	5.098773
SULFUR	0.007971

FEED RATE, #/SEC= 1.57

ENTHALPY, BTU/# = 1502.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGD/100ML =	9.80
MGD PRESLAKED, NU=0, YES=1	1
% SLAKED TO MG(OH)2, MEAS. =	*****

PRODUCT AND BASE PHYSICAL PROPERTIES •

ACID STRENGTH, pH	=	7.30
SP. GRAVITY, HYDROM.	=	1.0520

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	=	**
FLYASH CONC. GM/100ML	=	**

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-192	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST,H2O	0.9500E 01	N.G. FLOW,ZSCALE	0.9900E 02
TIME	0330	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.9000E 01
PRI.AIR ST,HG	0.1300E 01	FURN. ST,H2O	0.3800E 01	SCREW SPEED,RPM	0.3000E 03
PRI.AIR DP,H2O	0.2000E 01	PP EXIT ST,HG	-0.8000E 00	U2 FURN.EX.%-BM	0.5300E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.4600E 01	COMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.3800E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAPOMETRIC,HG	0.2894E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NCZ.,PSIG	0.0	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR DRIF.	0.1100E 03	PART.SCRUB.IN	0.3900E 03
ABS NCZ.,PSIG	0.2600E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3950E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3450E 03
ABS DRIF.INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NDZ.CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6200E 03	PRI.AIR FAN IN.	0.8000E 02
		NO.2 BANK OUT	0.5300E 03	PRI.AIR WGT BULB	0.6600E 02
CARD NUMBER	7	FURN. EXIT	0.4350E 03	SEC.AIR FAN IN.	0.5400E 02
MODE OF OPER.	5	COAL-AIR	0.1150E 03	SEC.AIR WET BULB	0.5300E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H2O	0.0				
PART.CYC.DP,H2O	0.0				
#1 DRIF.ST,HG	0.1500E 00				
#1 DRIF.DP,H2O	0.4700E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1000E 00
ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.3000E 01
		FBA DP,H2O	0.5400E 01
		FBA DEMIST.DP,H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 DRIFICE	0.3950E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3450E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1270E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1270E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.4374E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1310E 03	ABS H2O FI.GAL	0.4386E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.2030E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1270E 03	MGOH2 TANK	0.1260E 03	MGO ROTU.SCALE,%	0.2400E 02
MGO SLAK TANK	0.1990E 03			MAKEUP SETTING	0.2400E 02
MGOH2 TANK	0.1240E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-192

DATE 5-14-70

TIME OF DAY 0330

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	14.25	---	---	28.50	233.6	5319.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	14.76	---	---	*****	253.0	5325.	CARBON 0.423063
							HYDROGEN 0.525854
							OXYGEN 1.399379
PART. SCRUBBER							NITROGEN 5.096523
INPUT, #/HR	*****	---	---	*****	*****	*****	SULFUR 0.008017
OUTPUT, #/HR	*****	---	---	*****	*****	*****	

SO2 ABSORBERS

INPUT, #/HR	14.76	12.72	*****	1367.	4846.
OUTPUT, #/HR	14.94	10.68	*****	1350.	5385.

*

*SO2 ABSORBERS-PRODUCT COMP.

TOTAL,	2.87	0.4491	---	---	---
COMBINED	2.73	0.4267	---	---	---
FREE	0.14	0.0225	---	---	---
MONO(TOTAL)	2.59	0.4042	---	---	---
MONO(DISSOLVED)	1.18	0.1844	1.917	---	---
MONO(SOLID)	1.41	0.2198	4.661	---	---
BISULFITE	0.28	0.0219	0.407	---	---
MGO	0.0	0.0	0.0	---	---
SULFATE	0.43	0.0669	0.802	---	---
MAGNESIUM	3.16	0.4935	---	---	---
FLYASH	---	---	*****	---	---
SOLIDS, MG	---	---	*****	---	---

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML	=	9.80
MGO PRESLAKED, NO=0, YES=1	=	1
% SLAKED TO MG(OH)2, MEAS.	=	*****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH	=	6.80
SP. GRAVITY, HYDROM.	=	1.0560

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH	=	*****
FLYASH CONC. GM/100ML	=	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	M-193	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST, H2O	0.1000E 02	N.G. FLOW, %SCALE	0.1000E 03
TIME	0600	BURNER DP, H2O	0.5700E 01	N.G. STATIC, R.O.	0.9200E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.4000E 01	SCREW SPEED, RPM	0.3000E 03
PRI. AIR DP, H2O	0.2000E 01	PP EXIT ST, HG	-0.8000E 00	O2 FURN. EX. % - BM	0.5200E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.4600E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.4000E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2896E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F	0.1100E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR GRIF.	0.7600E 03	PART. SCRUB. IN	0.4000E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX-TOP	0.7300E 03	#1 GRIFICE	0.4050E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.3600E 03
ABS GRIF. INCH	0.4600E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6450E 03	PRI. AIR FAN IN.	0.8000E 02
		NO. 2 BANK OUT	0.5500E 03	PRI. AIR WGT BULB	0.6600E 02
CARD NUMBER	7	FURN. EXIT	0.4500E 03	SEC. AIR FAN IN.	0.5400E 02
MODE OF OPER.	0	COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.5100E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0				
PART. CYC. DP, H2O	0.0				
#1 GRIF. ST, HG	0.2000E 00				
#1 GRIF. DP, H2O	0.4600E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 00
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3800E 01
		FBA DP, H2O	0.4600E 01
		FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 GRIFICE	0.4050E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1280E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1280E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4395E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1320E 03	ABS H2O FI. GAL	0.4408E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.6800E 02	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1280E 03	MGOH2 TANK	0.1560E 03	MGO ROTO. SCALE, %	0.3200E 02
MGO SLAK TANK	0.6800E 02			MAKEUP SETTING	0.3200E 02
MGOH2 TANK	0.1520E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-193

DATE 5-14-70

TIME OF DAY 0600

INPUT FOR EQ. - KIN. PROG.

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS
INPUT, #/HR	14.70	-----	29.39	235.4	5448.
OUTPUT, #/HR	15.83	-----	*****	255.0	5454.
PART. SCRUBBER					
INPUT, #/HR	*****	-----	*****	*****	*****
OUTPUT, #/HR	*****	-----	*****	*****	*****

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

14.76	12.72	*****	1367.	4846.
14.94	10.68	*****	1350.	5385.

* SO2 ABSORBERS-
PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML
TOTAL	2.08	0.3246	-----
COMBINED	2.08	0.3246	-----
FREE	0.0	0.0	-----
MONO(TOTAL)	2.08	0.3246	-----
MONO(DISSOLVED)	1.10	0.1719	1.787
MONO(SOLID)	0.98	0.1528	3.239
BISULFITE	0.0	0.0	0.0
MGO	0.10	0.0159	0.064
SULFATE	0.27	0.0423	0.507
MAGNESIUM	2.45	0.3828	-----
FLYASH	-----	-----	*****
SOLIDS, MG	-----	-----	*****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.60
MGO PRESLAKED, NO=0, YES=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.80
SP. GRAVITY, HYDROM. = 1.0520

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-194	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST,H2O	0.8000E 01	N.G. FLOW, SCALE	C.9800E 02
TIME	1000	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	C.9400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.3000E 01	SCREW SPEED,RPM	C.3700E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-2000E 01	Q2 FURN.EX.%-BM	C.1100E 01
SEC.AIR ST,HG	0.1400E 01	PP EXIT DP,H2O	0.5000E 01	CCMB.FURN.EX.%	0.0
SEC.AIR DP,H2O	0.2200E 01	FURN.EX.ST,H2O	0.3000E 01	ELE.CHEM.MILVCLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2904E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NUZ.,PSIG	0.0	TEMP.FURN.RECORDER,F	0.1000E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR GRIF.	0.7600E 03	PART.SCRUB.IN	0.4300E 03
ABS NUZ.,PSIG	0.2700E 02	WINDBOX-TUP	0.7400E 03	#1 GRIFICE	C.4300E 03
ABS LOAD,PSIG	0.5200E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	C.3800E 03
ABS ORIF.INCH	0.4200E 01	WINDBOX-ROT.	0.7500E 03	AIR HEATER #1	C.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-FAST	0.6900E 03	AIR HEATER #2	C.8500E 03
MANUMETER CODE	0	NO.1 BANK OUT	0.5900E 03	PRI.AIR FAN IN.	0.9400E 02
		NO.2 BANK OUT	0.4800E 03	PRI.AIR WGT BULB	0.7600E 02
CARD NUMBER	7	FURN. EXIT	0.1200E 03	SEC.AIR FAN IN.	0.5600E 02
MODE OF OPER.	5	COAL-AIR		SEC.AIR WET BULB	C.5600E 02
PART.SCR.ST,HG	0.0				
PART.SCR.DP,H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.0	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-2000E 00
#1 ORIF.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	C.2400E 01
#1 ORIF.DP,H2O	0.4900E 01			FBA DP,H2O	C.6800E 01
				FBA DEMIST.DP,H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3600E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1330E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1330E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.4454E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI.GAL	0.4463E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1260E 03	MGOH2 TANK	0.1340E 03	MGO ROTO.SCALE,%	C.5700E 02
MGO SLAK TANK	0.1740E 03			MAKEUP SETTING	0.5700E 02
MGOH2 TANK	0.1280E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER	M-194	DATE	5-14-70	TIME OF DAY	1000										
FLUE GAS DATA						FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR						496.	120.0					0.016	75.8	488.	16.3
SECONDARY AIR						4795.	747.5					0.010	63.2	4745.	9.0
FURNACE EXIT						5763.	480.0	3638.0	16.5			0.058	116.8	5447.	3.0
PART. SCRUB. INLET						*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
PART. CYC. EXIT						5103.	430.0	*****	*****	*****	*****	0.058	116.7	4823.	1.4
VENT ABS. INLET						*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS. CYC. EXIT						*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN						5103.	380.0	*****	*****	*****	*****	0.058	116.7	-----	-2.7
FLOATING BED EX						5988.	133.0	*****	*****	*****	*****	0.113	135.3	-----	-27.1
P.P. EXIT ORIF.						5988.	133.0	*****	*****	*****	*****	0.113	135.3	5382.	-27.1

SCRUBBER STREAM DATA									
PARTICULATE	TEMP. F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FBA	TEMP. F	FLOW, #/M	TEMP. F	FLOW, #/M
MAKEUP WATER	---	---	MAKEUP WATER	---	---	---	---	---	---
PRODUCT LIQ.	---	---	MAKEUP MGD SL.	---	---	---	---	---	---
RECIRCULATED LIQ.	---	---	PRODUCT LIQ.	---	---	---	---	---	---
	---	---	REC. (SPRAY NOZ.)	---	---	---	---	---	---
	---	---	REC. (FLOW NOZ.)	---	---	---	---	---	---

FURNACE PERFORMANCE									
HEAT RELEASE, BTU/HR	0.624E 07	SO2 ABSORB. EFF	---	VENT. ABS.	---	---	---	---	---
% FUEL AS COAL	96.8	FLYASH COL. EFF	---	---	---	---	---	---	---
CGAL FLOW RATE, #/HR	496.8	SO3 ABSORB. EFF	---	---	---	---	---	---	---
NAT. GAS FLOW, #/HR	8.9	NOX ABSORB. EFF	---	---	---	---	---	---	---
% EXCESS AIR	5.2	GAS VELOCITY, FPS	---	---	---	---	---	---	---
OXYGEN, DRY, MEAS.	1.10	LIQ/GAS, GAL/MCF	---	---	---	---	---	---	---
CO2, DRY-CALC.	17.13	LIQ/GAS, #/100	---	---	---	---	---	---	---
HUMIDITY, #/100 - CALC.	0.058	PRES. DROP, IN. WG	---	---	---	---	---	---	---

SO2 ABSORPTION PARAMETERS									
VENTURI ABSORBER	FLUATING BED ABSORBER								
KGA, #MOLE/HR-FT2, =	KG/A, #MOLE/HR-FT2								
SULFITE/SO2-MOL/MUL =	SULFITE/SO2-MOL/MOL								
SUMP RESID. TIME, MIN =	SUMP RESID. TIME, MIN								

SULFATE FORMATION PARAMETERS									
CUNC., GR-MOLE/L =	0.0472								
MOL% TOTAL SULF =	10.22								
O2 AT FURN. EX. =	1.10								
U2 AT ABSORB. IN =	---								
C2 AT ABSORB. EX =	---								

**** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-194

DATE 5-14-70

TIME OF DAY 1000

MATERIAL BALANCES

SULFUR MAGNESIUM FLYASH WATER DRY GAS

FURNACE
INPUT, #/HR 18.38
OUTPUT, #/HR 20.52

36.76

315.4

5437.
5447.

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

16.77
8.83

4823.
5382.

*
*SO2 ABSORBERS-
PRODUCT COMP.

GM SO2/
100ML

GRAM/
100ML

MAKEUP MGC COMPOSITION

SLURRY CONC. - GM MGC/100ML = 7.70
MGC PRESLAKED, NO=0, YES=1
% SLAKED TO MGC(OH)2, MEAS. =

TOTAL, 2.72
COMBINED 2.44
FREE 0.29
MONO(TOTAL) 2.15
MONO(DISSOLVED) 0.90
MONO(SOLID) 1.25
BISULFITE 0.52
MGO 0.0
SULFATE 0.30
MAGNESIUM 2.74
FLYASH
SOLIDS, MG

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.80
SP. GRAVITY, HYDROM. = 1.0400

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =
FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

INPUT FOR EQ. - KIN. PROC.

INPUT FLOWS, # ATOMS/100# FEED

CARBON 0.525299
HYDROGEN 0.663504
OXYGEN 1.387482
NITROGEN 5.002385
SULFUR 0.010008

FEED RATE, #/SEC = 1.59

ENTHALPY, BTU/# = -1768.

*
*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-195	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST, H2O	0.5000E 01	N.G. FLOW, #SCALE	0.9800E 02
TIME	1130	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.9200E 01
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1000E 01	SCR. SPEED, RPM	0.3700E 03
PRI. AIR DP, H2O	0.2600E 01	PP EXIT ST, HG	-0.1200E 01	02 FURN. EX. #2-BM	0.2000E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5500E 01	COMB. FURN. EX. #2	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.1200E 01	ELE. CHEM. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2910E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F	0.1300E 03	TEMP. CONTINUED	
PART. LGAD, PSIG	0.0	SEC. AIR GRIF.	0.7600E 03	PART. SCRUB. IN	0.4600E 03
ABS NOZ., PSIG	0.2700E 02	WINDBOX-TOP	0.7400E 03	#1 ORIFICE	0.4600E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.4000E 03
ABS ORIF. INCH	0.4200E 01	WINDBOX-EAST	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	NO.1 BANK OUT	0.7300E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.2 BANK OUT	0.6200E 03	PRI. AIR FAN IN.	0.8800E 02
CARD NUMBER	7	FURN. EXIT	0.5150E 03	PRI. AIR WGT BULB	0.7200E 02
MODE OF OPER.	5	CGAL-AIR	0.1300E 03	SEC. AIR FAN IN.	0.6800E 02
PART. SCR. ST, HG	0.0	CARD NUMBER	8	SEC. AIR WET BULB	0.6500E 02
PART. SCR. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	ABS CYC. DP, H2O	0.0	FBA INLET ST, HG	-0.6000E 00
#1 ORIF. ST, HG	0.2000E 00	CARD NUMBER	11	FBA SUMP DP, H2O	0.2400E 01
#1 ORIF. DP, H2O	0.5200E 01	TEMP. THERMOMETERS, F	0.0	FBA DP, H2O	0.5200E 01
CARD NUMBER	10	PART. CYC. EXIT	0.0	FBA DEMIST. DP, H2O	0.1100E 01
TEMP. PILOT RECORDER, F	0.4150E 03	ABS CYC. EXIT	0.0	CARD NUMBER	12
#1 CRIFICE	0.3600E 03	PART. CYC. SUMP	0.0	MAKEUP FLCONS	
FBA INLET	0.1360E 03	ABS CYC. SUMP	0.0	PART. INIT. GAL	0.0
FBA EXIT	0.1360E 03	FBA SUMP	0.1320E 03	PART. FINAL, GAL	0.0
P. P. EXIT	0.0	MGO SLAK TANK	0.1750E 03	PART. TIME, MIN	0.0
PART. CYC. SUMP	0.0	MGOH2 TANK	0.1400E 03	ABS H2O IN. GAL	0.4463E 05
ABS CYC. SUMP	0.0	CARD NUMBER	11	ABS H2O FI. GAL	0.4495E 05
FBA SUMP	0.1340E 03	TEMP. THERMOMETERS, F	0.0	ABS H2O TIME, MIN	0.1900E 03
MGO SLAK TANK	0.1720E 03	PART. CYC. EXIT	0.0	MGO ROTO. SCALE, #	0.6000E 02
MGOH2 TANK	0.1380E 03	ABS CYC. EXIT	0.0	MAKEUP SETTING	0.6000E 02
MAKEUP WATER	0.6200E 02	PART. CYC. SUMP	0.0		

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-195

DATE 5-14-70

TIME OF DAY 1130

FLUE GAS DATA

	FLW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/OSCF	HUM. #/#	DEW POINT F	DRY FLW #/HR	STAT PRES IN. H2O
PRIMARY AIR	513.	130.0	---	---	---	---	0.014	71.7	506.	16.3
SECONDARY AIR	4761.	747.5	---	---	---	---	0.014	70.8	4697.	5.0
FURNACE EXIT	5722.	515.0	3668.2	---	753.	---	0.059	117.0	5405.	1.2
PART. SCRIB. INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART. CYC. EXIT	5176.	460.0	*****	*****	*****	*****	0.059	117.2	4889.	2.7
VENT ABS. INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5176.	400.0	*****	*****	*****	*****	0.059	117.2	---	-P.1
FLOATING BED EX	6342.	136.0	*****	*****	*****	*****	0.120	138.5	---	-16.3
P.P. EXIT GRIF.	6342.	136.0	10.6	*****	690.	0.0482	0.120	138.5	5662.	-16.3

SCRUBBER STREAM DATA

	TEMP, F	FLW, GPM	GAS ABSORBER	TEMP, F	FLW, #/M	TEMP, F	FLW, #/M
PARTICULATE	*****	*****	MAKEUP WATER	*****	*****	62.0	14.1
MAKEUP WATER	*****	*****	MAKEUP WGO SL.	*****	6.4	138.0	6.3
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	*****	132.0	14.3
RECIRCULATED LIQ.	*****	*****	REC. (SPRAY NOZ)	*****	*****	132.0	394.7
			REC. (FLW NOZ.)	*****	*****		426.3

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.593E 07
% FUEL AS COAL	96.7
COAL FLOW RATE, #/HR	471.3
NAT. GAS FLOW, #/HR	8.9
% EXCESS AIR	9.5
OXYGEN, % DRY, MEAS.	2.00
CO2, % DRY-CALC.	16.35
HUMIDITY, #/# - CALC.	0.059

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	*****
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	*****
LIG/GAS, GAL/MCF	*****
LIG/GAS, #/#	*****
PRES. DROP, IN. WG	*****

VENT ABS.

FLUAT. RED	99.71
*****	*****
*****	*****
*****	*****
*****	8.33
*****	13.5
*****	29.7
*****	4.0
*****	5.2

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	*****
SULFITE/SC2-MCL/MCL	*****
SUMP RESID. TIME, MIN	*****

FLCATING BED ABSORBER

KGA, #MOLE/HR-FT2	= 68.3
SULFITE/SC2-MCL/MCL	= 6.88
SUMP RESID. TIME, MIN	= 16.9

SULFATE FORMATION PARAMETERS

CUNC., GR-MOLE/L	= 0.0395
MOL% TOTAL SULF	= 7.03
O2 AT FURN. EX.	= 2.00
O2 AT ABSORB. IN	*****
O2 AT ABSORB. EX	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-196	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST,H2O	0.8000E 01	N.G. FLOW,2SCALE	0.9800E 02
TIME		BURNER DP,H2O	0.5600E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1200E 01	FURN. ST,H2O	0.2000E 01	SCREEN SPEED,RPM	0.3100E 03
PRI.AIR DP,H2O	0.2400E 01	PP EXIT ST,HG	-0.8000E 00	02 FURN.EX.8-BM	0.3200E 01
SEC.AIR ST,HG	0.1500E 01	PP EXIT DP,H2O	0.4800E 01	COMB.FURN.EX.8	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BARGUMETRIC,HG	0.2900E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.0	TEMP.FURN.RECORDER,F		TEMP.CONTINUED	
PART.LOAD,PSIG	0.0	SEC.AIR ORIF.	0.1400E 03	PART.SCRUB.IN	0.3000E 03
ABS NOZ.,PSIG	0.2700E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.3800E 03
ABS LOAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1400E 03
ABS ORIF.INCH	0.4400E 01	WINDBOX-BOT.	0.7500E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.6000E 03	PRI.AIR FAN IN.	0.9400E 02
CARD NUMBER	7	NO.2 BANK OUT	0.5200E 03	PRI.AIR WGT BULB	0.7500E 02
MODE OF OPER.	5	FURN. EXIT	0.3200E 03	SFC.AIR FAN IN.	0.7700E 02
PART.SCR.ST,HG	0.2000E 00	COAL-AIR	0.1100E 03	SEC.AIR WET BULB	0.7000E 02
PART.SCR.DP,H2O	0.2000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.2000E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.2000E 00
#1 ORIF.ST,HG	0.1000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1200E 01
#1 ORIF.DP,H2O	0.4400E 01			FBA DP,H2O	0.8000E 00
				FBA DEMIST.DP,H2O	0.1000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILGT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART.CYC.EXIT	0.0	PART.INIT.GAL	0.0
FBA INLET	0.3600E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.0
FBA EXIT	0.1250E 03	PART.CYC.SUMP	0.0	PART.TIME,MIN	0.0
P.P.EXIT	0.1240E 03	ABS CYC.SUMP	0.0	ABS H2O IN.GAL	0.4030E 05
PART.CYC.SUMP	0.0	FBA SUMP	0.1350E 03	ABS H2O FI.GAL	0.4039E 05
ABS CYC.SUMP	0.0	MGO SLAK TANK	0.1800E 03	ABS H2O TIME,MIN	0.6100E 02
FBA SUMP	0.1300E 03	MGOH2 TANK	0.1350E 03	MGO ROTO.SCALE,%	0.2000E 02
MGO SLAK TANK	0.1800E 03			MAKEUP SETTING	0.2000E 02
MGOH2 TANK	0.1360E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-196

DATE 5-14-70

TIME OF DAY

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SU2 PPM	SO3 PPM	NOX PPM	FLYASH GR/USCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRFS IN.H2O
PRIMARY AIR	500.	110.0	---	---	---	---	0.015	74.2	493.	16.3
SECONDARY AIR	4734.	750.0	---	---	---	---	0.016	74.9	4662.	8.0
FURNACE EXIT	5650.	320.0	3522.8	---	---	---	0.058	116.5	5341.	2.2
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
PART.CYC.EXIT	4957.	380.0	*****	*****	*****	*****	0.058	116.4	4686.	1.4
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	0.058	116.4	---	*****
FLOATING BED IN	4957.	140.0	*****	*****	*****	*****	0.061	117.2	---	-2.7
FLOATING BED EX	6106.	125.0	*****	*****	*****	*****	0.061	117.2	---	-10.4
P.P. EXIT ORIF.	6106.	124.0	16.7	*****	*****	*****	0.061	117.2	5753.	-10.8

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FDA
PARTICULATE	*****	*****	MAKEUP WATER	TEMP,F FLOW,#/M	TEMP,F FLOW,#/M
MAKEUP WATER	*****	*****	MAKEUP MGO SL.	*****	62.0 12.4
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	136.0 3.3
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	*****	135.0 9.3
			REC.(FLOW NOZ.)	*****	135.0 394.7
				*****	436.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.552E 07
% FUEL AS COAL	96.4
COAL FLOW RATE,#/HR	437.0
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	15.2
OXYGEN,% DRY, MEAS.	3.20
CO2,% DRY-CALC.	15.30
HUMIDITY,#/# - CALC.	0.058

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER	
KGA,#MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME,MIN	*****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SU2 ABSORB.EFF	*****
FLYASH CUL.EFF	*****
SO3 ABSORB.EFF	*****
NEX ABSORB.EFF	*****
GAS VELCITY,FPS	*****
LIQ/GAS,GAL/MCF	*****
LIQ/GAS,#/#	*****
PRES.DROP,IN.WG	*****

PART.

VENT ABS.

FLOAT.BED

99.53	*****	*****	*****	*****	*****
12.2	*****	*****	*****	*****	*****
33.4	*****	*****	*****	*****	*****
4.3	*****	*****	*****	*****	*****
0.8	*****	*****	*****	*****	*****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2	=	63.7
SULFITE/SO2-MOL/MOL	=	5.33
SUMP RESID.TIME,MIN	=	36.4

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L=	0.0275
MOL% TOTAL SULF=	7.56
O2 AT FURN.EX.=	3.20
O2 AT ABSORB.IN=	*****
O2 AT ABSORB.EX=	*****

RUN NUMBER M-196

DATE 5-14-70

TIME OF DAY

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PRUG.

FURNACE

INPUT, #/HR 16.17
 OUTPUT, #/HR 19.62

WATER

290.1
 309.3

FLYASH

32.34

MAGNESIUM

SULFUR

16.17
 19.62

PART. SCRUBBER

SU2 ABSORBERS

19.62
 6.89

PRODUCT COMP.

2.25
 2.25
 0.0
 2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

TOTAL, COMBINED

2.25
 2.25
 0.0
 2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MONO(TOTAL)

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MONO(DISSOLVED)

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MONO(SOLID)

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

BISULFITE

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MGO

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

SULFATE

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MAGNESIUM

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

FLYASH

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

SOLIDS, MG

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

COAL COMPOSITION-MASS

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

CARBON

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

HYDROGEN

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

OXY+NIT

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

SULFUR

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

ASH

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

WATER

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

FEED RATE, #/SEC = 1.56

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

ENTHALPY, BTU/# = -2800.

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MAKEUP H2O COMPOSITION

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

SLURRY CONC. - GM MGO/100ML = 7.10

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MGO PRESLAKED, NO=0, YES=1

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

% SLAKED TO MG(OH)2, MEAS. = *****

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

PRODUCT MG BASE PHYSICAL PROPERTIES

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

ACID STRENGTH, PH = 7.70

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

SP. GRAVITY, HYDROM. = 1.0400

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

PARTICULATE SCRUBBER PRODUCT

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

ACID STRENGTH, PH = *****

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

FLYASH CONC. GM/100ML = *****

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

6.871

2.25
 0.86
 1.39
 0.28
 0.21
 0.18
 2.63

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	M-197	CARD NUMBER	3
DATE	5-14-70	N.G. FLW, %SCALE	0.9800E 02
TIME	1530	N.G. STATIC, R.O.	0.9200E 01
PRI. AIR ST, HG	0.1200E 01	SCREW SPEED, RPM	0.3900E 03
PRI. AIR DP, H2O	0.2400E 01	02 FURN. EX. % - BM	0.2000E 01
SEC. AIR ST, HG	0.1200E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2906E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR GRIF.	0.1300E 03	PART. SCRUB. IN	0.4600E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.7600E 03	#1 GRIFICE	0.4600E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7200E 03	FBA INLET	0.4000E 03
ABS ORIF. INCH	0.4400E 01	WINDBOX-BOT.	0.7200E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.7500E 03	PRI. AIR FAN IN.	0.8900E 02
		NO. 2 BANK OUT	0.6300E 03	PRI. AIR WGT BULB	0.7200E 02
		FURN. EXIT	0.5200E 03	SEC. AIR FAN IN.	0.6900E 02
		CUAL-AIR	0.1300E 03	SEC. AIR WET BULB	0.6500E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.		VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.6000E 00
PART. SCR. ST, HG	0.0	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3000E 01
PART. SCR. DP, H2O	0.0			FBA DP, H2O	0.5000E 01
PART. CYC. DP, H2O	0.0			FBA DEMIST. DP, H2O	0.1000E 01
#1 GRIF. ST, HG	0.2000E 00				
#1 GRIF. DP, H2O	0.5400E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMUMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1370E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1380E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4495E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1400E 03	ABS H2O FI. GAL	0.4507E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1760E 03	ABS H2O TIME, MIN	0.9000E 02
FBA SUMP	0.1360E 03	MGOH2 TANK	0.1350E 03	MGO ROTO. SCALE, %	0.6100E 02
MGO SLAK TANK	0.1700E 03			MAKEUP SETTING	0.6100E 02
MGOH2 TANK	0.1330E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBER PROGRAM-INTERMIT DATA PAGE 11

RUN NUMBER M-197

DATE 5-14-70

TIME OF DAY 1530

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	MUX PPH	FLYASH GR/DSCF	HUMID. #/LB	DRY PULVER F	DRY FUELS #/HR	STAT APRIS 110.1120
PRIMARY AIR	492.	130.0	----	----	----	----	0.0114	71.3	44.66	11.3
SECONDARY AIR	4758.	737.5	----	----	----	----	0.0113	70.6	44.65	11.0
FURNACE EXIT	5656.	520.0	3453.7	-----	-----	2.4981	0.0158	116.98	59322.	11.4
PART.SCRB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
PART.CYC.EXIT	5271.	460.0	*****	*****	*****	*****	0.0558	117.00	44986.	2.7
VENT.ARS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
ABS.CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
FLOATING BED IN	5271.	400.0	*****	*****	*****	*****	0.0558	117.00	-----	11.1
FLOATING BED EX	6381.	137.0	*****	*****	*****	*****	0.1122	118.98	-----	11.3
P.P. EXIT DRIF.	6381.	138.0	26.2	*****	*****	0.10638	0.1122	118.98	56688.	11.3

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	CAS ABSORBER	VENTURI ABSORBER	FERR
PARTICULATE	*****	*****	MAKEUP WATER	TEMP, F FLOW, #/M	TEMP, F FLOW, #/M
MAKEUP WATER	*****	*****	MAKEUP MGD SL.	*****	622.00 10.7
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	1333.00 12.3
RECIRCULATED LIQ.	*****	*****	REC. (SPRAY NOZ.)	*****	1400.00 10.4
			REC. (FLOW NOZ.)	*****	1400.00 371.1
				*****	435.3

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.591E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLODATION
% FUEL AS COAL	96.7	SO2 ABSORB. EFF	*****	*****	999.244
COAL FLOW RATE, #/HR	469.2	FLYASH COL. EFF	*****	*****	997.245
NAT. GAS FLOW, #/HR	8.9	SO3 ABSORB. EFF	*****	*****	*****
% EXCESS AIR	9.5	NCX ABSORB. EFF	*****	*****	*****
OXYGEN, % DRY, MEAS.	2.00	GAS VELOCITY, FPS	*****	*****	113.56
CO2, % DRY-CALC.	16.35	LIQ/GAS, GAL/MCF	*****	*****	380.00
HUMIDITY, #/# - CALC.	0.058	LIQ/GAS, #/H	*****	*****	44.11
		PRES. DROP, IN. WG	*****	*****	55.00

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER		FLOATING BED ABSORBER	
KGA, #MOLE/HR-FT2, =	*****	KGA, #MOLE/HR-FT2	= 57.22
SULFITE/SO2-MOL/MUL =	*****	SULFITE/SO2-MOL/MOL	= 6.555
SUMP RESID. TIME, MIN =	*****	SUMP RESID. TIME, MIN	= 30.22
***** MEANS ITEM NOT MEASURED			

SAMPLE FLOATION PARAMETERS

CONC., GPM-MOLE/L	= 00.10442
MULE TOTAL SULF	= 16.002
UZ AT FURN. EXH.	= 22.100
UZ AT ABSORBER IN	= *****
UZ AT ABSORBER EXH	= *****

RUN NUMBER M-197

DATE 5-14-70

TIME OF DAY 1530

MATERIAL BALANCES

FURNACE
INPUT, #/HR 17.36
OUTPUT, #/HR 19.31

PART. SCRUBBER
INPUT, #/HR *****
OUTPUT, #/HR *****

SO2 ABSORBERS
INPUT, #/HR 19.31
OUTPUT, #/HR 10.44

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 3.00
COMBINED 2.92
FREE 0.08
MONO(TOTAL) 2.83
MONO(DISSOLVED) 1.02
MONO(SOLID) 1.81
BISULFITE 0.40
MGO 0.0
SULFATE 0.28
MAGNESIUM 3.20
FLYASH -----
SOLIDS, MG -----

SULFUR
17.36
19.31

MAGNESIUM

FLYASH
34.72
22.38

WATER
295.5
314.7

DRY GAS
5372.
5382.

GM SO2/
100ML

GM-MOLE/
LITER

GRAM/
100ML

0.4687
0.4558
0.0129
0.4428
0.1594
0.2835
0.0313
0.0
0.0442
0.5000

22.38

1.657
6.009
0.581
0.0
0.531

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

INPUT FUR EOD. - KKH, PRDG.

INPUT FLOWS, #/MIN
CARBON 005983776
HYDROGEN 006821906
OXYGEN 113889980
NITROGEN 550222204
SULFUR 000009588

FEED RATE, #/SEC = 1.57

ENTHALPY, BTU/# = -2710.

MAKEUP MGO CONC./TOTAL

SLURRY CONC. - COM MGO/TOTAL =

MGO PRESLAKED, NUC=1, WES=1

% SLAKED TO MGO/H2O, MEAS. =

PRODUCT MG MAKE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 6.000

SP. GRAVITY, HYDROM. = 1.04700

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =

FLYASH CONC. COM/TOTAL =

MAGNESIUM BASE SLURRY SCHEDULING

TEST NUMBER	M-198	CARD NUMBER	2	CARD NUMBER	65
DATE	5-14-70	WINDBOX ST, H2O	0.6600E 01	TEMP. CONTINUED	
TIME	1700	BURNER DP, H2O	0.6000E 01	PART. SCHEDULING	0.4700E 003
PRI. AIR ST, HG	0.1200E 01	FURN. ST, H2O	0.1600E 01	#1 ORIFICE	0.4700E 003
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, H2O	0.1400E 01	FBA INLET	0.4000E 003
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5600E 01	AIR HEATER #1	0.8500E 003
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.1200E 01	AIR HEATER #2	0.8500E 003
		PEEPSITE DP, HG	0.0	PRI. AIR FMAN IN	0.9600E 002
		P. SITE ST, PSIG	0.0	PRI. AIR WGT BULK	0.7400E 002
				SEC. AIR FMAN IN	0.7600E 002
				SEC. AIR WGT BULK	0.7400E 002

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	8
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1300E 03	PART. SCHEDULING	0.4700E 003
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.7600E 03	#1 ORIFICE	0.4700E 003
ABS. LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.4000E 003
ABS ORIF. INCH	0.4000E 01	WINDBOX-BUT.	0.7300E 03	AIR HEATER #1	0.8500E 003
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7400E 03	AIR HEATER #2	0.8500E 003
MANOMETER CODE	0	NO.1 BANK CUT	0.7500E 03	PRI. AIR FMAN IN	0.9600E 002
		NO.2 BANK CUT	0.6400E 03	PRI. AIR WGT BULK	0.7400E 002
CARD NUMBER	7	FURN. EXIT	0.5200E 03	SEC. AIR FMAN IN	0.7600E 002
MODE OF OPER.	5	COAL-AIR	0.1250E 03	SEC. AIR WGT BULK	0.7400E 002
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	99
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	0.5000E 000
#1 ORIF. ST, HG	0.2000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3800E 001
#1 ORIF. DP, H2O	0.5400E 01			FBA DP, H2O	0.5400E 001
				FBA DP, H2O	0.1200E 001

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLUIDS	
#1 ORIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INLET, GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FMAN, GAL	0.0
FBA EXIT	0.1360E 03	PART. CYC. SUMP	0.0	PART. THERM, MIN	0.0
P. P. EXIT	0.1360E 03	ABS CYC. SUMP	0.0	AUS H2O IN, GAL	0.6500E 005
PART. CYC. SUMP	0.0	FBA SUMP	0.1300E 03	AUS H2O FIL, GAL	0.6515E 005
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1680E 03	AUS H2O THERM, MIN	0.6500E 002
FBA SUMP	0.1360E 03	MGOH2 TANK	0.1300E 03	MGO PETROL SCALE, #	0.5600E 002
MGO SLAK TANK	0.1650E 03			MAKEUP SETTING	0.5600E 002
MGOH2 TANK	0.1290E 03				
MAKEUP WATER	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-198

DATE 5-14-70

TIME OF DAY 1700

FLUE GAS DATA

UE GAS DATA	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/H	DEW POINT F	DRY FLOW #/HR	STAT PATS IN.H2O
PRIMARY AIR	495.	125.0	---	---	---	---	0.014	71.7	488.	14.3
SECONDARY AIR	4752.	740.0	---	---	---	---	0.019	80.6	4664.	6.0
FURNACE EXIT	5686.	520.0	***	***	***	***	0.063	119.3	5349.	1.2
PART.SCRB.INLET	***	***	***	***	***	***	***	***	---	***
PART.CYC.EXIT	5236.	470.0	***	***	***	***	0.063	119.4	4926.	2.7
VENT ABS.INLET	***	***	***	***	***	***	***	***	---	***
ABS CYC.EXIT	***	***	***	***	***	***	***	***	---	***
FLOATING BED IN	5236.	400.0	***	***	***	***	0.063	119.4	---	-6.8
FLOATING BED EX	6367.	136.0	***	***	***	***	0.123	139.0	---	-10.0
P.P. EXIT ORIF.	6367.	136.0	31.7	***	***	***	0.123	139.0	5667.	-10.0

SCRUBBER STREAM DATA

UBBER STREAM DATA					
	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	F-BA
ARTICULATE	*****	*****	MAKEUP WATER	*****	62.0
MAKEUP WATER	*****	*****	MAKEUP MGD SL.	*****	10.6
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	6.0
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ)	*****	129.0
			REC.(FLOW NUZ.)	*****	138.0
				*****	138.0
				*****	377.1
				*****	416.0

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR
% FUEL AS COAL
COAL FLOW RATE, #/HR
NAT. GAS FLOW, #/HR
% EXCESS AIR
OXYGEN, % DRY, MEAS.
CO₂, % DRY-CALC.
HUMIDITY, #/# - CALC.

SCRUBBER PERFORMANCE

UBBER PERFORMANCE
S02 ABSORB.EFF
FLYASH COL.EFF
S03 ABSORB.EFF
NOX ABSORB.EFF
GAS VELOCITY,FPS
LIQ/GAS,GAL/MCF
LIQ/GAS,#/#
PRES.DROP,IN.WG

VENT ABS. FIDAT. REF.

FLOAT • BED
 99.11
 13.7
 28.5
 3.9
 5.4

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

FLOATING BED ABSORBER

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      KGA, #MOL/HR-FT2,
      SULFITE/SO2-MOL/MOL
      SUMP RESID.TIME, MIN

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KGA, #MOLE/HR-FT2	=	55.2
SULFITE/SO2-MOL/MOL	=	5.00
SUMP RESID.TIME, MIN	=	31.5

SULFATE FORMATION PARAMETERS

CONC.,6M-HOLE/L=	0.0428
MOL% TOTAL SULF=	7.44
O2 AT FURN.EX.=	2.20
O2 AT ABSORB.IN=	***
O2 AT ABSORB.EX=	***

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-198

DATE 5-14-70

TIME OF DAY 1700

INPUT FOR EQ. - KIN.PROG.

MATERIAL BALANCES

FURNACE
INPUT, #/HR 17.08
OUTPUT, #/HR 19.82

PART. SCRUBBER
INPUT, #/HR *****
OUTPUT, #/HR *****

SO2 ABSORBERS
INPUT, #/HR 19.82
OUTPUT, #/HR 14.47

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,
COMBINED 3.58
FREE 3.37
MONO(TOTAL) 0.21
MONO(DISSOLVED) 3.16
MONO(SOLID) 0.84
BISULFITE 2.32
MGO 0.48
SULFATE 0.0
MAGNESIUM 0.27
FLYASH 3.64
SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS

17.08 ----- 34.15 317.1 5340.
19.82 ----- ***** 336.3 5349.

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGC/100ML = *****
MGO PRESLAKED, NO=0, YES=1 1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 6.50
SP.GRAVITY, HYDROM. = 1.0580

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

FFED RATE, #/SEC = 1.56
ENTHALPY, BTU/# = -5038.

INPUT FLOWS, #ATOMS/100#FFED
CARBON 0.498937
HYDROGEN 0.619638
OXYGEN 1.390536
NITROGEN 5.026663
SULFUR 0.009493

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-199	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-70	WINDBOX ST, H2O	0.6600E 01	N.G. FLOW, KSCALE	0.1000E 03
TIME	2030	BURNER DP, H2O	0.5800E 01	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.1000E 01	SCREW SPEED, RPM	0.3750E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1600E 01	O2 FURN. EX. % - BM	0.2400E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5400E 01	COMP. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEN. MILVOLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2904E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR GRIF.	0.1200E 03	PART. SCRUB. IN	
ABS NOZ., PSIG	0.2450E 02	WINDBOX-TOP	0.7550E 03	#1 ORIFICE	0.4100E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.4150E 03
ABS ORIF. INCH	0.4300E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.3600E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7450E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6700E 03	PRI. AIR FAN IN.	0.8700E 02
		NO. 2 BANK OUT	0.5650E 03	PRI. AIR WGT BULB	0.7200E 02
CARD NUMBER	7	FURN. EXIT	0.4650E 03	SFC. AIR FAN IN.	0.6600E 02
MODE CF OPER.	5	COAL-AIR	0.1250E 03	SEC. AIR WGT BULB	0.6400E 02
PART. SCR. ST, HG	0.0				
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.4000E 00
#1 ORIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.7500E 01
#1 ORIF. DP, H2O	0.5000E 01			FBA DP, H2O	0.6400E 01
				FBA DEMIST. DP, H2O	0.1200E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4150E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3600E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1330E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.1330E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4542E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1370E 03	ABS H2O FI. GAL	0.4544E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.9400E 02	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1330E 03	MGOH2 TANK	0.1600E 03	MGO ROTO. SCALE, %	0.4900E 02
MGO SLAK TANK	0.9000E 02			MAKEUP SETTING	0.4900E 02
MGOH2 TANK	0.1550E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-199

DATE 5-14-70

TIME OF DAY 2030

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NGX PPM	FLYASH GR/DSCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN. H2O
PRIMARY AIR	495.	125.0	---	---	---	---	0.014	72.1	488.	17.6
SECONDARY AIR	4806.	740.0	---	---	---	---	0.013	70.3	4742.	6.6
FURNACE EXIT	5741.	465.0	3587.1	---	---	---	0.058	116.3	5428.	1.0
PART.SCRUB.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
PART.CYC.EXIT	5188.	415.0	*****	*****	*****	*****	0.058	116.4	4906.	1.4
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	0.058	116.4	*****	*****
FLOATING BED IN	5188.	360.0	*****	*****	*****	*****	0.058	116.4	*****	*****
FLOATING BED EX	6264.	133.0	*****	*****	*****	*****	0.108	134.5	*****	-5.4
P.P. EXIT ORIF.	6264.	133.0	13.4	*****	*****	*****	0.108	134.5	5651.	-21.7
										-21.7

SCRUBBER STREAM DATA

	TEMP, F	FLW, GPM	GAS ABSORBER	VENTURI ABSORBER	TEMP, F	FLW, #/H	TEMP, F	FLW, #/H
PARTICULATE	*****	*****	MAKEUP WATER	*****	*****	*****	60.0	8.3
MAKEUP WATER	*****	*****	MAKEUP MGD SL.	*****	*****	*****	155.0	5.5
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	*****	*****	137.0	12.4
RECIRCULATED LIQ.	*****	*****	REC.(SPRAY NOZ.)	*****	*****	*****	137.0	372.6
			REC.(FLW NOZ.)	*****	*****	*****		431.3

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.584E 07
% FUEL AS COAL	96.6
COAL FLOW RATE, #/HR	463.6
NAT.GAS FLOW, #/HR	9.1
% EXCESS AIR	11.4
OXYGEN, % DRY, MEAS.	2.40
CO2, % DRY-CALC.	16.00
HUMIDITY, #/# - CALC.	0.058

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	*****
SULFITE/SO2-MOL/MOL	*****
SUMP RESID.TIME, MIN	*****

***** MEANS ITEM NOT MEASURED

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	*****
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NGX ABSORB.EFF	*****
GAS VELOCITY, FPS	*****
LIQ/GAS, GAL/MCF	*****
LIQ/GAS, #/#	*****
PRES.DROP, IN.WG	*****

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	65.2
SULFITE/SO2-MOL/MOL	=	7.37
SUMP RESID.TIME, MIN	=	19.5

SULFATE FORMATION PARAMETERS

CONC., GM-MULL/L	=	0.0403
MULE TOTAL SULF	=	9.31
U2 AT FURN. EX	=	2.40
U2 AT ABSORB.IN	=	*****
U2 AT ABSORB.EX	=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-199

DATE 5-14-70

TIME OF DAY 2030

MATERIAL BALANCES

FURNACE
 INPUT, #/HR 17.15
 OUTPUT, #/HR 20.25
 PART. SCRUBBER
 INPUT, #/HR *****
 OUTPUT, #/HR *****

SO2 ABSORBERS
 INPUT, #/HR 20.25
 OUTPUT, #/HR 10.62

* SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 2.59
 COMBINED 2.59
 FREE 0.0
 MONO(TOTAL) 2.59
 MONO(DISSOLVED) 1.20
 MONO(SOLID) 1.39
 BISULFITE 0.0
 MGO 0.25
 SULFATE 0.26
 MAGNESIUM 3.09
 FLYASH -----
 SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

SULFUR 17.15 20.25

MAGNESIUM 34.30

FLYASH 293.3 312.8

WATER 5419. 5428.

DRY GAS *****

INPUT FOR EQ. - KIN. PRDG.

INPUT FLOWS, #ATON/100#FEED
 CARBON 0.494124
 HYDROGEN 0.617459
 OXYGEN 1.391098
 NITROGEN 5.031094
 SULFUR 0.009399

FEED RATE, #/SEC= 1.58

ENTHALPY, BTU/# = -2414.

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.80
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(UH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.20
 SP. GRAVITY, HYDRUM. = 1.0600

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-200	CARD NUMBER	2	CARD NUMBER	3
DATE	5-14-76	WINDBOX ST, H2O	0.6000E 01	N.G. FLOW, KSCALE	0.1000E 03
TIME	2230	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.D.	0.7300E 01
PRI. AIR ST, HG	0.1300E 01	FURN. ST, H2O	0.5000E 00	SCREEN SPEED, RPM	0.3800E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1200E 01	O2 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1300E 01	PP EXIT DP, H2O	0.5600E 01	COB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.5000E 00	ELE. CHEM. FILVCLT	0.0
		PEEPSITE UP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2900E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F	0.1150E 03	TEMP. CONTINUED	0.4200E 03
PART. LOAD, PSIG	0.0	SEC. AIR GRIF.	0.7550E 03	PART. SCRUB. IN	0.4300E 03
ABS NOZ., PSIG	0.2350E 02	WINDBOX-TOP	0.7300E 03	#1 ORIFICE	0.3700E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.8500E 03
ABS ORIF. INCH	0.4100E 01	WINDBOX-NOT.	0.7450E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7000E 03	AIR HEATER #2	0.8500E 02
MANOMETER CODE	0	NO. 1 BANK OUT	0.5900E 03	PRI. AIR FAN IN.	0.7100E 02
CARD NUMBER	7	NO. 2 BANK OUT	0.4850E 03	PRI. AIR WGT RULB	0.6600E 02
MODE OF OPER.	5	FURN. EXIT	0.1200E 03	SEC. AIR FAN IN.	0.6300E 02
PART. SCR. ST, HG	0.0	COAL-AIR		SEC. AIR WGT RULB	0.6300E 02
PART. SCR. DP, H2O	0.0	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.0	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.6000E 00
#1 ORIF. ST, HG	0.1000E 00	ABS CYC. DP, H2O	0.0	FBA SUPP DP, H2O	0.1500E 01
#1 ORIF. DP, H2O	0.5600E 01			FBA DP, H2O	0.6500E 01
				FBA DEMIST. DP, H2O	0.1200E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILGT RECORDER, F	0.4300E 03	TEMP. THERMOMETERS, F	0.0	MAKEUP FLOWS	0.0
#1 ORIFICE	0.3700E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.1340E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.0
FBA EXIT	0.1340E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P. P. EXIT	0.0	ABS CYC. SUMP	0.1370E 03	ABS H2O IN. GAL	0.4550E 05
PART. CYC. SUMP	0.0	FBA SUMP	0.1300E 03	ABS H2O FI. GAL	0.4559E 05
ABS CYC. SUMP	0.1370E 03	MGU SLAK TANK	0.1500E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1120E 03	MGU2 TANK		MGD ROTO. SCALE, %	0.5400E 02
MGU SLAK TANK	0.1430E 03			MAKEUP SETTING	0.5400E 02
MGU2 TANK	0.6000E 02				
MAKEUP WATER					

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER M-200

DATE 5-14-70

TIME OF DAY 2230

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NUX PPM	FLYASH GR/CSCT	HUM. #/#	DEW POINT F	DRY FLUX #/HR	STAT PRES IN. H2O
PRIMARY AIR	497.	120.0	---	---	---	---	0.014	71.4	490.	17.6
SECONDARY AIR	4827.	740.0	---	---	---	---	0.013	68.8	4767.	6.0
FURNACE EXIT	5760.	485.0	3423.8	---	---	---	0.056	115.5	5453.	0.5
PART. SCRUB. INLET	---	---	---	---	---	---	---	---	---	---
PART. CYC. EXIT	5444.	430.0	---	---	---	---	0.056	115.6	5153.	1.4
VENT ABS. INLET	---	---	---	---	---	---	---	---	---	---
ABS CYC. EXIT	---	---	---	---	---	---	---	---	---	---
FLOATING BED IN	5444.	370.0	---	---	---	---	0.056	115.6	---	0.1
FLCATING BED EX	6412.	134.0	---	---	---	---	0.111	135.9	---	16.3
P.P. EXIT ORIF.	6412.	134.0	22.9	---	---	---	0.111	135.9	5769.	16.3

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER MAKEUP WATER	VENTURI ABSORBER TEMP, F	FBA TEMP, F	FLOW, #/M	FLOW, #/M
PARTICULATE	---	---	---	---	---	---	---
MAKEUP WATER	---	---	---	---	---	---	---
PRODUCT LIQ.	---	---	---	---	---	---	---
RECIRCULATED LIQ.	---	---	---	---	---	---	---

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.578E 07
% FUEL AS COAL	96.5
COAL FLOW RATE, #/HR	458.5
NAT. GAS FLOW, #/HR	9.1
% EXCESS AIR	12.9
OXYGEN, DRY, MEAS.	2.70
CO2, DRY-CALC.	15.74
HUMIDITY, #/# - CALC.	0.056

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	---
FLYASH CUL. EFF	---
SO3 ABSORB. EFF	---
NUX ABSORB. EFF	---
GAS VELOCITY, FPS	---
LIQ/GAS, GAL/MCF	---
LIQ/GAS, #/#	---
PRES. DROP, IN. WG	---

VENT ABS.

FLUAT. BED	90.33
---	---
---	---
---	---
---	---
---	13.6
---	20.1
---	3.9
---	6.5

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	---
SULFITE/SO2-MOL/MOL	=	---
SUMP RESID. TIME, MIN	=	---

FLCATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	59.7
SULFITE/SO2-MOL/MOL	=	7.01
SUMP RESID. TIME, MIN	=	19.5

SULFATE FORMATION PARAMETERS

CONC., GM-MOLE/L	=	0.0393
NOL% TOTAL SULF	=	7.31
O2 AT FURN. EX.	=	2.70
O2 AT ABSORB. IN	=	---
O2 AT ABSORB. EX	=	---

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCORBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-200 DATE 5-14-70 TIME OF DAY 2230
 INPUT FOR EQ. - KIN. PROC.

MATERIAL BALANCES
 FURNACE
 INPUT, #/HR 16.96
 OUTPUT, #/HR 19.44
 PART. SCRUBBER
 INPUT, #/HR
 OUTPUT, #/HR
 INPUT FLOWS, #/100 FEED
 CARBON 0.485924
 HYDROGEN 0.607280
 OXYGEN 1.391945
 NITROGEN 5.037722
 SULFUR 0.009261

FEED RATE, #/SEC = 1.59

ENTHALPY, BTU/# = -1927.

SO2 ABSORBERS
 INPUT, #/HR 19.44
 OUTPUT, #/HR 13.39

* SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL,
 COMBINED
 FREE
 MONO(TOTAL)
 MONO(DISSOLVED)
 MONO(SOLID)
 BISULFITE
 MGO
 SULFATE
 MAGNESIUM
 FLYASH
 SOLIDS, MG
 MAKEUP MGO COMPOSITION
 SLURRY CONC. - GM MGD/100ML = 9.80
 MGO PRESLAKED, NO=0, YES=1
 % SLAKED TO MG(OH)2, MEAS. =
 PRODUCT MG BASE PHYSICAL PROPERTIES
 ACID STRENGTH, PH = 7.10
 SP. GRAVITY, HYDROM. = 1.0620
 PARTICULATE SCRUBBER PRODUCT
 ACID STRENGTH, PH =
 FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER DATE TIME	M-201 5-15-70 0030	CARD NUMBER WINDBOX ST,H20 BURNER DP,H20 FURN. ST,H20 PP EXIT ST,HG PP EXIT DP,H20 FURN.EX.ST,H20 PEEPSITE DP,HG P.SITE ST,PSIG	2 0.6000E 01 0.6000E 01 0.5000E 00 -0.1300E 01 0.5500E 01 0.5000E 00 0.0 0.0	CARD NUMBER N.G. FLOW,%SCALE N.G. STATIC,R.O. SCREW SPEED,RPM O2 FURN.EX.%-BM CONF.FURN.EX.% ELE.CHEM.MILVOLT CELL TEMP,F BAROMETRIC,HG	3 0.1000E 03 0.8000E 01 0.3750E 03 0.2800E 01 0.0 0.0 0.0 0.2904E 02
CARD NUMBER PART.NOZ.,PSIG PART.LOAD,PSIG ABS NOZ.,PSIG ABS LCAD,PSIG ABS ORIF,INCH ABSORBER NOZ. CODE MANOMETER CODE	4 0.0 0.0 0.2400E 02 0.5000E 02 0.4300E 01 1 0	CARD NUMBER TEMP.FURN.RECORDER,F SEC.AIR ORIF. WINDBOX-TOP WINDBOX-WEST WINDBOX-BOT. WINDBOX-FAST NO.1 BANK OUT NO.2 BANK OUT FURN. EXIT COAL-AIR	5 0.1100E 03 0.7550E 03 0.7300E 03 0.7300E 03 0.7400E 03 0.7150E 03 0.6050E 03 0.4900E 03 0.1200E 03	CARD NUMBER TEMP.CONTINUED PART.SCRUB,IN #1 ORIFICE FBA INLET AIR HEATER #1 AIR HEATER #2 PRI.AIR FAN IN. PRI.AIR WGT BULB SEC.AIR FAN IN. SEC.AIR WET BULB	6 0.4200E 03 0.4200E 03 0.3650E 03 0.8500E 03 0.8500E 03 0.8600E 02 0.7300E 02 0.6200E 02 0.6200E 02
CARD NUMBER MODE OF OPER. PART.SCR.ST,HG PART.SCR.DP,H20 PART.CYC.DP,H20 #1 URIF,ST,HG #1 ORIF.DP,H20	7 5 0.0 0.0 0.2000E 00 0.5700E 01	CARD NUMBER VENT.ABS.DP,H20 ABS CYC.DP,H20	8 0.0 0.0	CARD NUMBER FBA INLET ST,HG FBA SUMP DP,H20 FBA DP,H20 FBA DEMIST,DP,H20	9 -0.7000E 00 0.2300E 01 0.6400E 01 0.1000E 01
CARD NUMBER TEMP.PILOT RECORDER,F #1 ORIFICE FBA INLET FBA EXIT P.P.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK MAKEUP WATER	10 0.4200E 03 0.3650E 03 0.1330E 03 0.1330E 03 0.0 0.0 0.1340E 03 0.2030E 03 0.1320E 03 0.6000E 02	CARD NUMBER TEMP.THERMOMETERS,F PART.CYC.EXIT ABS CYC.EXIT PART.CYC.SUMP ABS CYC.SUMP FBA SUMP MGO SLAK TANK MGOH2 TANK	11 0.0 0.0 0.0 0.0 0.1370E 03 0.2060E 03 0.1360E 03	CARD NUMBER MAKEUP FLOWS PART.INIT,GAL PART.FINAL,GAL PART.TIME,MIN ABS H2O IN,GAL ABS H2O FI,GAL ABS H2O TIME,MIN MGO ROTO.SCALE,% MAKEUP SETTING	12 0.0 0.0 0.0 0.4573E 05 0.4582E 05 0.6000E 02 0.5200E 02 0.5200E 02

RUN NUMBER M-201

DATE 5-15-70

TIME OF DAY 0030

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

FLUE GAS DATA

UNIT	TEMP.	SO2	SO3	NUX	FLYASH	HUM.	DEW	DRY	STAT
	F	PPM	PPM	PPM	GR/DSCF	#/%	POINT	FLW	PRFS
							F	#/HR	IN. H2O
PRIMARY AIR	120.0	---	---	---	---	0.015	74.2	490.	17.6
SECONDARY AIR	738.8	---	---	---	---	0.013	69.2	4786.	6.0
FURNACE EXIT	490.0	3635.9	*****	*****	*****	0.056	115.6	5472.	0.5
PART. SCRB. INLET	*****	*****	*****	*****	*****	*****	*****	---	*****
PART. CYC. EXIT	420.0	*****	*****	*****	*****	0.056	115.8	5257.	2.7
VENT ABS. INLET	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	365.0	*****	*****	*****	*****	0.056	115.8	---	-5.5
FLOATING BED EX	133.0	*****	*****	*****	*****	0.110	135.4	---	-17.6
P.P. EXIT ORIF.	133.0	37.7	*****	*****	*****	0.110	135.4	5720.	-17.6

SCRUBBER STREAM DATA

RUHBER STREAM DATA	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI	FBA
PARTICULATE	*****	*****	MAKEUP WATER	TEMP, F	TEMP, F
MAKEUP WATER	*****	*****	MAKEUP MGD SL.	*****	11.7
PRODUCT LIQ.	*****	*****	PRODUCT LIQ.	*****	5.7
RECIRCULATED LIQ.	*****	*****	REC. (SPRAY NOZ)	*****	11.9
			REC. (FLOW NOZ.)	*****	369.1
				*****	431.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.577E 07	S02 ABSORB.EFF
% FUEL AS COAL	96.5	FLYASH CUL.EFF
COAL FLOW RATE,#/HR	457.6	S03 ABSORB.EFF
NAT.GAS FLOW,#/HR	9.1	NOX ABSORB.EFF
% EXCESS AIR	13.3	GAS VELOCITY,FPS
OXYGEN,%DRY,MEAS.	2.80	LIQ/GAS,GAL/MCF
CO2,%DRY-CALC.	15.65	LIQ/GAS,#/#
HUMIDITY,#/# - CALC.	0.056	PRES.DROP,IN.WG

SO₂ ABSORPTION PARAMETERS

VENTURI ABSORBER

```

KGA, #MOLE/HR-FT2,
SULFITE/SO2-MOL/MOL
SUMP RESID.TIME, MIN

```

*****	MEANS	ITEM	NOT	MEASURED
1	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00
33	1.00	1.00	1.00	1.00
34	1.00	1.00	1.00	1.00
35	1.00	1.00	1.00	1.00
36	1.00	1.00	1.00	1.00
37	1.00	1.00	1.00	1.00
38	1.00	1.00	1.00	1.00
39	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00
41	1.00	1.00	1.00	1.00
42	1.00	1.00	1.00	1.00
43	1.00	1.00	1.00	1.00
44	1.00	1.00	1.00	1.00
45	1.00	1.00	1.00	1.00
46	1.00	1.00	1.00	1.00
47	1.00	1.00	1.00	1.00
48	1.00	1.00	1.00	1.00
49	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00
51	1.00	1.00	1.00	1.00
52	1.00	1.00	1.00	1.00
53	1.00	1.00	1.00	1.00
54	1.00	1.00	1.00	1.00
55	1.00	1.00	1.00	1.00
56	1.00	1.00	1.00	1.00
57	1.00	1.00	1.00	1.00
58	1.00	1.00	1.00	1.00
59	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00
61	1.00	1.00	1.00	1.00
62	1.00	1.00	1.00	1.00
63	1.00	1.00	1.00	1.00
64	1.00	1.00	1.00	1.00
65	1.00	1.00	1.00	1.00
66	1.00	1.00	1.00	1.00
67	1.00	1.00	1.00	1.00
68	1.00	1.00	1.00	1.00
69	1.00	1.00	1.00	1.00
70	1.00	1.00	1.00	1.00
71	1.00	1.00	1.00	1.00
72	1.00	1.00	1.00	1.00
73	1.00	1.00	1.00	1.00
74	1.00	1.00		

SULFATE FORMATION PARAMETERS

FLOATING BED ADSORBER

KGA, MMOLE/HR-FT2	=	54.0		CONC., GR-MULE/L =	0.0334
SULFITE/SO2-MOL/MOL	=	6.34		MOL% TOTAL SULF=	5.77
SUMP RESID.TIME, MIN	=	24.4		O2 AT FURN. EX.=	2.80
				O2 AT ABSORB.IN=	*****
				O2 AT ABSORB.EX=	*****

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-201

DATE 5-15-70

TIME OF DAY 0030

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROC.

INPUT FLOWS, #ATOMS/100#FEED
CARBON 0.484522
HYDROGEN 0.619119
OXYGEN 1.392229
NITROGEN 5.039932
SULFUR 0.009214

FEED RATE, #/SEC= 1.60

ENTHALPY, BTU/# = -2029.

SULFUR MAGNESIUM FLYASH WATER DRY GAS

FURNACE
INPUT, #/HR 16.93
OUTPUT, #/HR 20.72

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

SO2 ABSORBERS
INPUT, #/HR 20.72
OUTPUT, #/HR 13.99

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 3.64
COMBINED 3.41
FREE 0.23
MONO(TOTAL) 3.18
MONO(DISSOLVED) 1.06
MONO(SOLID) 2.12
BISULFITE 0.64
MGU 0.0
SULFATE 0.21
MAGNESIUM 3.63
FLYASH
SOLIDS, MG

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 9.80
MGO PRESLAKED, NU=0, YES=1
% SLAKED TO MG(OH)2, MEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.20
SP. GRAVITY, HYDROM. = 1.0640

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH =
FLYASH CONC. GM/100ML =

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	M-202	CARD NUMBER	3
DATE	5-15-7C	N.G. FLOW, %SCALE	0.1000E 03
TIME	0230	N.G. STATIC, R.O.	0.8200E 01
PRI. AIR ST, HG	0.1300E 01	SCREW SPEED, RPM	0.3750E 03
PRI. AIR DP, H2O	0.2400E 01	O2 FURN. EX. % - BM	0.2700E 01
SEC. AIR ST, HG	0.1400E 01	CUMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	ELE. CHEM. MILVOLT	0.0
		CELL TEMP, F	0.0
		BAROMETRIC, HG	0.2902E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.0	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.0	SEC. AIR ORIF.	0.1050E 03	PART. SCRUB. IN	0.4400E 03
ABS NOZ., PSIG	0.2200E 02	WINDBOX - TOP	0.7500E 03	#1 ORIFICE	0.4400E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX - WEST	0.7300E 03	FHA INLET	0.3750E 03
ABS ORIF. INCH	0.3500E 01	WINDBOX - BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NUZ. CODE	1	WINDBOX - EAST	0.7400E 03	AIR HEATER #2	0.8500E 03
PANOMETER CODE	0	NO. 1 BANK OUT	0.7200E 03	PRI. AIR FAN IN.	0.8300E 02
		NO. 2 BANK OUT	0.6100E 03	PRI. AIR WGT BULB	0.7200E 02
		FURN. EXIT	0.5000E 03	SEC. AIR FAN IN.	0.6500E 02
		COAL - AIR	0.1150E 03	SEC. AIR WGT BULB	0.6300E 02

CARD NUMBER	7	CARD NUMBER	8	CARD NUMBER	9
MODE OF OPER.		VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.4000E 00
PART. SCR. ST, HG	0.0	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.3100E 01
PART. SCR. DP, H2O	0.0			FBA LP, H2O	0.6400E 01
PART. CYC. DP, H2O	0.0			FBA DEMIST. DP, H2O	0.3000E 00
#1 ORIF. ST, HG	0.1000E 00				
#1 ORIF. DP, H2O	0.5400E 01				

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.4400E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.0
FBA INLET	0.3750E 03	ABS CYC. EXIT	0.0	PART. FINAL GAL	0.0
FBA EXIT	0.1350E 03	PART. CYC. SUMP	0.0	PART. TIME, MIN	0.0
P.P. EXIT	0.1350E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4592E 05
PART. CYC. SUMP	0.0	FHA SUMP	0.1380E 03	ABS H2O FI. GAL	0.4599E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.1000E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1360E 03	MGOH2 TANK	0.1600E 03	MGO ROTO. SCALE, %	0.3800E 02
MGO SLAK TANK	0.9600E 02			MAKEUP SETTING	0.3800E 02
MGOH2 TANK	0.1560E 03				
MAKEUP WATER	0.6000E 02				

RUN NUMBER M-202

DATE 5-15-70

TIME OF DAY 0230

FLUE GAS DATA

UNIT	TEMP.	SO2	SUB	NOX	FLYASH	HUM.	DEN	DRY	STAT
	F	PPM	PPM	PPM	GR/DSCF	#/#	POINT	FLOW	PRESS
VALUE GAS DATA							F	#/HR	IN. H2O
PRIMARY AIR	115.0	---	---	---	---	0.015	73.8	492.	17.6
SECONDARY AIR	737.5	---	---	---	---	0.013	69.4	4814.	6.3
FURNACE EXIT	500.0	3441.4	***	805.	4.0815	0.057	115.7	5503.	0.5
PART. SCRB. INLET	***	***	***	***	***	***	***	---	***
PART. CYC. EXIT	440.0	***	***	***	***	0.057	115.8	5029.	1.4
VENT ABS. INLET	***	***	***	***	***	***	***	---	***
ABS CYC. EXIT	***	***	***	***	***	***	***	---	***
FLOATING BED IN	375.0	***	***	***	***	0.057	115.8	---	-5.4
FLOATING BED EX	135.0	***	***	***	***	0.110	135.3	---	-17.6
P.P. EXIT ORIF.	135.0	31.7	***	***	***	0.110	135.3	5658.	-17.6

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER		FLA	
	TEMP, F	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
ARTICULATE	*****	*****	*****	60.0	9.7
MAKEUP WATER	*****	*****	*****	156.0	4.6
PRODUCT LIQ.	*****	*****	6.4	138.0	12.4
RECIRCULATED LIQ.	*****	*****	*****	138.0	349.2
			*****		389.1

FURNACE PERFORMANCE

[illegible]

SC2 ABSORPTION PARAMETERS

VENTURI ABSCBER

```

**      = **      = **      =
KGA,#MOLE/HR-FT2,
SULFITE/SO2-MCL/MUL
SUMP RESID.TIME,MIN

```

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	54.8
SULFITE/SC2-MOL/MOL	=	5.76
SUMP RESID.TIME, MIN	=	16.5

SULFATE FORMATION PARAMETERS

```
CONC.,GM-MULF/L=      0.0413
MUL% TOTAL SULF=      7.06
02 AT FURN.FX.=      2.70
02 AT ABSORB.IN.=      ***
02 AT ABSORB.EX.=      ***
```

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER M-202

DATE 5-15-70

TIME OF DAY 0230

MATERIAL BALANCES

FURNACE
INPUT, #/HR 17.12
OUTPUT, #/HR 19.72

SULFUR
MAGNESIUM
FLYASH
WATER
DRY GAS

INPUT FOR EQ. - KIN. PROG.

INPUT FLOWS, #AIBORS/100#FEED
CARBON 0.486970
HYDROGEN 0.619339
OXYGEN 1.391949
NITROGEN 5.037677
SULFUR 0.009263

PART. SCRUBBER
INPUT, #/HR
OUTPUT, #/HR

MAGNESIUM
FLYASH
WATER
DRY GAS

SO2 ABSORBERS
INPUT, #/HR
OUTPUT, #/HR

FEED RATE, #/SEC= 1.60
ENTHALPY, BTU/# = -2142.

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL,
COMBINED
FREE
MONO(TOTAL)
MONO(DISSOLVED)
MONO(SOLID)
BISULFITE
MGU
SULFATE
MAGNESIUM
FLYASH
SOLIDS, MG

GM SO2/
100ML
GM-MOLE/
LITER
GRAM/
100ML

MAKEUP MGO COMPOSITION
SLURRY CONC. - GM MGO/100ML = 9.60
MGO PRE-SLAKED, NG=0, YFS=1
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 7.30
SP.GRAVITY, HYDROM. = 1.0640

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE 1

TEST NUMBER	N-203	CARD NUMBER	2	CARD NUMBER	3
DATE	5/27/70	WINDBOX ST, H2O	0.7000E 01	N.G. FLOW, %SCALE	0.9800E 02
TIME	1330	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.9400E 01
PRI. AIR ST, HG	0.1600E 01	FURN. ST, H2O	0.1200E 01	SCRUB SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2400E 01	PP EXIT ST, HG	-0.1400E 01	D2 FURN. EX. % - EM	0.3000E 01
SEC. AIR ST, HG	0.1400E 01	PP EXIT DP, H2O	0.5500E 01	COMP. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.1000E 01	ELE. CHEM. MILVELT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2897E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F	0.1200E 03	TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR ORIF.	0.7600E 03	PART. SCRUB. IN	0.3800E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.7300E 03	#1 ORIFICE	0.1250E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1300E 03
ABS ORIF. INCH	0.4200E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO. 1 BANK OUT	0.6600E 03	PRI. AIR FAN IN.	0.8200E 02
		NO. 2 BANK OUT	0.5600E 03	PRI. AIR WGT BULB	0.6500E 02
CARD NUMBER	7	FURN. EXIT	0.4700E 03	SEC. AIR FAN IN.	0.6200E 02
MCDE OF CPER.	3	COAL-AIR	0.1100E 03	SEC. AIR WGT BULB	0.5200E 02
PART. SCR. ST, HG	-0.2000E 00				
PART. SCR. DP, H2O	0.5200E 01				
PART. CYC. DP, H2O	0.4800E 01				
#1 ORIF. ST, HG	-0.8000E 00				
#1 ORIF. DP, H2O	0.4200E 01				

CARD NUMBER	8	CARD NUMBER	9
VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 01
ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
		FBA DP, H2O	0.6000E 01
		FBA DEMIST. DP, H2O	0.1400E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F	0.1250E 03	TEMP. THERMOMETERS, F	0.1300E 03	MAKEUP FLOWS	
#1 ORIFICE	0.1280E 03	PART. CYC. EXIT	0.0	PART. INIT. GAL	0.1360E 06
FBA INLET	0.1240E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.1364E 06
FBA EXIT	0.1240E 03	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.7900E 02
P. P. EXIT	0.1240E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4937E 05
PART. CYC. SUMP	0.1250E 03	FBA SUMP	0.1300E 03	ABS H2O FI. GAL	0.4945E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.7900E 02
FBA SUMP	0.1300E 03	MGOH2 TANK	0.7600E 02	MGO ROTO. SCALE, %	0.3500E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.3500E 02
MGOH2 TANK	0.7400E 02				
MAKEUP WATER	0.6200E 02				

RUN NUMBER N-203

DATE 5/27/70

TIME OF DAY 1330

FLUE GAS DATA

UNIT	TEMP.	SO2	SO3	NOX	FLYASH	HUM.	DEW	DRY	STAT
	F	PPM	PPM	PPM	GR/DSCF	#/4	POINT	FLOW	PRES
UNIT GAS DATA							F	#/HR	IN. H2O
PRIMARY AIR	110.0	---	---	---	---	0.010	62.3	439.	21.7
SECONDARY AIR	742.5	---	---	---	---	0.007	51.9	4783.	7.0
FURNACE EXIT	470.0	3338.1	***	***	***	0.050	111.8	5476.	1.0
PART. SCRB. INLET	380.0	***	***	***	***	0.050	111.8	---	-2.7
PART. CYC. EXIT	130.0	3314.2	***	***	***	0.080	125.9	5230.	-10.3
VENT ABS. INLET	***	***	***	***	***	***	***	---	***
ABS CYC. EXIT	***	***	***	***	***	***	***	---	***
FLOATING BED IN	128.0	***	***	***	***	0.080	125.9	---	-13.5
FLOATING BED EX	124.0	***	***	***	***	0.079	124.4	---	-16.0
P.P. EXIT ORIF.	124.0	597.5	***	***	***	0.079	124.4	5963.	-19.0

SCRUBBER STREAM DATA

RUBBER STREAM DATA		VENTURI ABSORBER				EBA	
	TEMP, F	FLOW, GPM	GAS ABSORBER	TEMP, F	FLOW, #/M	TEMP, F	FLOW, #/M
PARTICULATE			MAKEUP WATER	*****	*****	62.0	9.1
MAKEUP WATER	62.0	5.09		*****		74.0	4.4
PRODUCT LIQ.	132.0	5.09	MAKEUP MGD SL.	*****	6.4		
			PRODUCT LIQ.	*****	*****	130.0	9.0
RECIRCULATED LIQ.	132.0	23.15		*****	*****	130.0	377.1
			REC. (SPRAY NOZ)	*****	*****		426.3
			REC. (FLOW NOZ.)	*****	*****		

FURNACE PERFORMANCE

FURNACE PERFORMANCE		SCRUBBER PERFORMANCE		VENT AIRS		FLOAT, BED	
HEAT RELEASE, BTU/HR	0.572E 07	S02 ABSORB. EFF	0.72	***	81.97	***	***
% FUEL AS COAL	96.6	FLYASH COL. EFF	***	***	***	***	***
COAL FLOW RATE, #/HR	453.3	S03 ABSORB. EFF	***	***	***	***	***
NAT. GAS FLOW, #/HR	8.9	NOX ABSORB. EFF	***	***	***	***	***
% EXCESS AIR	14.3	GAS VELOCITY, FPS	148.9	***	13.3	***	***
OXYGEN, % DRY, MEAS.	3.00	LIQ/GAS, GAL/MCF	15.7	***	30.1	***	***
CO2, % DRY-CALC.	15.48	LIQ/GAS, #/#	2.1	***	4.0	***	***
HUMIDITY, #/# - CALC.	0.050	PRES. DROP, IN. WG	5.2	***	6.0	***	***

SO2 ABSORPTION PARAMETERS

FLOATING BED ABSORBER

LOADING BED ABSORBER	
KGA, #MOLE/HR-FT ²	= 21.1
SULFITE/SC2-MCL/MOL	= 6.09
SUMP RESID.TIME, MIN	= 37.6

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER N-203

DATE 5/27/70

TIME OF DAY 1330

MATERIAL BALANCES

FURNACE
INPUT, #/HR 16.77
OUTPUT, #/HR 19.05

PART. SCRUBBER
INPUT, #/HR 19.05
OUTPUT, #/HR 18.06

SO2 ABSORBERS
INPUT, #/HR 18.06
OUTPUT, #/HR 20.73

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 3.06
COMBINED 2.04
FREE 1.02
MONO(TOTAL) 1.02
MONO(DISSOLVED) 0.98
MONO(SOLID) 0.04
BISULFITE 2.12
MGD 0.0
SULFATE 3.21
MAGNESIUM 5.25
FLYASH
SOLIDS, MG

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR MAGNESIUM FLYASH WATER DRY GAS
INPUT, #/HR 16.77 256.5 33.55 5467.
OUTPUT, #/HR 19.05 275.7 5476.
PART. SCRUBBER
INPUT, #/HR 19.05 2822.
OUTPUT, #/HR 18.06 2969.
SO2 ABSORBERS
INPUT, #/HR 18.06 1218.
OUTPUT, #/HR 20.73 954.

INPUT FOR EQ. - KIN. PROC.
INPUT FLOWS, # ATOMS/100# FEED
CARBON 0.479778
HYDROGEN 0.561517
OXYGEN 1.392801
NITROGEN 5.044295
SULFUR 0.009125
FEED RATE, #/SEC = 1.60
ENTHALPY, BTU/# = 1027.

MAKEUP MGD COMPOSITION

SLURRY CONC. - GM MGD/100ML = 6.00
MGD PRESLAKED, NO=0, YES=1
% SLAKED TO MG(UH)2, MEAS. =

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.20
SP. GRAVITY, HYDROM. = 1.1000

PARTICULATE SCRUBBER PRODUCT
ACID STRENGTH, PH = 2.80
FLYASH CONC. GM/100ML =

* SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	N-204	CARD NUMBER	2	CARD NUMBER	3
DATE	5/27/70	WINDBOX ST,H2O	0.8000E 01	N.G. FLOW,SCALC	0.9800E 02
TIME	1430	BURNER DP,H2O	0.6000E 01	N.G. STATIC,R.O.	0.9400E 01
PRI.AIR ST, HG	0.1600E 01	FURN. ST,H2O	0.2000E 01	SCREEN SPEED,KPM	0.4000E 03
PRI.AIR DP,H2O	0.2600E 01	PP EXIT ST,HG	-0.1600E 01	D2 FURN.EX,%-DM	0.3000E 01
SEC.AIR ST,HG	0.1200E 01	PP EXIT DP,H2O	0.5500E 01	CCMR.FURN,EX.%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX.ST,H2O	0.2200E 01	ELE.CHEM.MILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2297E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NOZ.,PSIG	0.4000E 02	TEMP.FURN.RECORDFR,F	0.1200E 03	TEMP.CONTINUED	
PART.LOAD,PSIG	0.4200E 02	SEC.AIR CRIF.	0.7600E 03	PART.SCRUB.IN	0.3800E 03
ABS NOZ.,PSIG	0.2600E 02	WINDBOX-ICP	0.7300E 03	#1 URIFICE	0.1300E 03
ABS LGAD,PSIG	0.5000E 02	WINDBOX-WEST	0.7300E 03	FBA INLET	0.1300E 03
ABS DRIF,INCH	0.4400E 01	WINDBOX-BOT.	0.7300E 03	AIR HEATER #1	0.7500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.7500E 03
PANUMETER CODE	0	NC.1 BANK OUT	0.6700E 03	PRI.AIR FAN IN.	0.8800E 02
CARD NUMBER	7	NC.2 BANK OUT	0.5700E 03	PRI.AIR WGT HULB	0.6500E 02
MODE OF OPER.	3	FURN. EXIT	0.4700E 03	SEC.AIR FAN IN.	0.6700E 02
PART.SCR.ST,HG	-0.2000E 00	COAL-AIR	0.1200E 03	SEC.AIR WGT BULB	0.5600E 02
PART.SCR.DP,H2O	0.5000E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.4600E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.1200E 01
#1 CRIF,ST,HG	-0.1000E 01	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1200E 01
#1 URIF.DP,H2O	0.4200E 01	CARD NUMBER	11	FBA DP,H2O	0.6700E 01
		TEMP.THERMOMETERS,F	0.1300E 03	FBA DEMIST.DP,H2O	0.1200E 01
CARD NUMBER	10	PART.CYC.EXIT	0.0	CARD NUMBER	12
TEMP.PILOT RECORDER,F	0.1250E 03	ABS CYC.EXIT	0.0	MAKEUP FLOWS	
#1 CRIFICE	0.1270E 03	PART.CYC.SUMP	0.1320E 03	PART.INIT.GAL	0.1364E 06
FBA INLET	0.1260E 03	ABS CYC.SUMP	0.0	PART.FINAL,GAL	0.1366E 06
FBA EXIT	0.1260E 03	FBA SUMP	0.0	PART.TIME,MIN	0.3500E 02
P.P.EXIT	0.1260E 03	MGO SLAK TANK	0.7400E 02	ABS H2O IN,GAL	0.4945E 05
PART.CYC.SUMP	0.0	MGOH2 TANK	0.0	ABS H2O FI,GAL	0.4949E 05
ABS CYC.SUMP	0.1280E 03			ABS H2O TIME,MIN	0.3500E 02
FBA SUMP	0.0			MGO ROTO.SCALE,3	0.4200E 02
MGO SLAK TANK	0.7800E 02			MAKEUP SETTING	0.4200E 02
MGOH2 TANK	0.6200E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER N-204

DATE 5/27/70

TIME OF DAY 1430

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/USCF	HUM. #/#	DEW POINT F	DRY FLOW #/HR	STAT PRES IN.H2O
PRIMARY AIR	520.	120.0	-----	-----	-----	-----	0.009	59.6	516.	21.7
SECONDARY AIR	4799.	742.5	-----	-----	-----	-----	0.008	56.1	4760.	4.0
FURNACE EXIT	5750.	470.0	3296.4	-----	-----	-----	0.051	112.5	5470.	2.2
PART.SCRB.INLET	5750.	380.0	-----	-----	-----	-----	0.051	112.5	-----	-2.7
PART.CYC.EXIT	5630.	130.0	3254.7	-----	-----	-----	0.081	125.7	5210.	-13.5
VENT ABS.INLET	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ABS CYC.EXIT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FLOATING BED IN	5630.	127.0	-----	-----	-----	-----	0.081	125.7	-----	-16.3
FLOATING BED EX	6408.	126.0	-----	-----	-----	-----	0.074	121.9	-----	-21.7
P.P. EXIT DRIF.	6408.	126.0	686.0	-----	-----	-----	0.074	121.9	5949.	-21.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FMA
PARTICULATE					
MAKEUP WATER	62.0	4.91	MAKEUP WATER	TEMP,F FLOW,#/H	TEMP,F FLOW,#/H
PRODUCT LIQ.	132.0	5.09	MAKEUP MGD SL.	-----	62.0 5.7
RECIRCULATED LIQ.	132.0	23.15	PRODUCT LIQ.	-----	78.0 4.9
			REC.(SPRAY NOZ)	-----	130.0 12.8
			REC.(FLOW NOZ.)	-----	130.0 386.0
				-----	436.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.571E 07	SCRUBBER PERFORMANCE	PART.	VENT ABS.	FLAT,DEG
F FUEL AS COAL	96.6	SO2 ABSORB.EFF	1.27	-----	78.02
COAL FLOW RATE,#/HR	452.8	FLYASH CUL.EFF	-----	-----	-----
NAT.GAS FLOW,#/HR	8.9	SO3 ABSORB.EFF	-----	-----	-----
EXCESS AIR	14.3	NOX ABSORB.EFF	-----	-----	-----
OXYGEN,ZDRY,MEAS.	3.00	GAS VELOCITY,FPS	149.5	-----	13.3
CO2,ZDRY-CALC.	15.48	LIQ/GAS,GAL/MCF	15.6	-----	30.7
HUMIDITY,#/# - CALC.	0.051	LIQ/GAS,#/#	2.1	-----	4.1
		PRES.DROP,IN.WG	5.0	-----	6.0

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA,#MOLE/HR-FT2, = *****
 SULFITE/SO2-MOL/MOL = *****
 SUMP RESID.TIME,MIN = *****

FLOATING BED ABSORBER

KGA,#MOLE/HR-FT2 = 19.2
 SULFITE/SO2-MOL/MOL = 4.14
 SUMP RESID.TIME,MIN = 30.5

SULFATE FORMATION PARAMETERS

CONC.,GM-MOLE/L = 0.4335
 MOL% TOTAL SULF = 46.35
 O2 AT FURN.FX = 3.00
 O2 AT ABSORB.IN = *****
 O2 AT ABSORB.EX = *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER N-204

DATE 5/27/70

TIME OF DAY 1430

MATERIAL BALANCES

FURNACE
INPUT, #/HR 16.75
OUTPUT, #/HR 18.79

PART. SCRUBBER
INPUT, #/HR 18.79
CUTPUT, #/HR 17.67

SO2 ABSORBERS
INPUT, #/HR 17.67
OUTPUT, #/HR 30.59

* SO2 ABSORBERS-
PRODUCT COMP.

TOTAL, 3.68
COMBINED 2.28
FREE 1.40
MONO(TOTAL) 0.88
MONO(DISSOLVED) 0.64
MONO(SOLID) 0.24
BISULFITE 2.48
MGO 0.0
SULFATE 3.18
MAGNESIUM 5.46
FLYASH -----
SOLIDS, MG -----

COAL COMPOSITION-MASS

CARBON 0.7150
HYDROGEN 0.0485
OXY+NIT 0.0817
SULFUR 0.0370
ASH 0.0740
WATER 0.0438

SULFUR 16.75
MAGNESIUM -----
FLYASH 33.51
WATER 261.3
DRY GAS 5461.
5470.

18.79

2740.
2969.
5470.
5210.

17.67

1238.
1122.
5210.
5969.

GM SO2/
100ML
GM-MOLE/
LITER
GRAM/
100ML

0.5751
0.3563
0.2188
0.1375
0.1000
0.0375
0.1937
0.0
0.4966
0.8529

0.041

INPUT FOR EQ. - K1A.PREG.

INPUT FLOWS, #ATOMS/100#FLED
CARBON 0.479771
HYDROGEN 0.548984
OXYGEN 1.392801
NITROGEN 5.044302
SULFUR 0.009125

FEED RATE, #/SEC= 1.59

ENTHALPY, BTU/# = 524.

MAKEUP MG COMPOSITION

SLURRY CONC.- GM H2O/100ML = *****
MG PRESLAKED, MG=0, YES=1 0
% SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES
ACID STRENGTH, PH = 5.00
SP.GRAVITY, HYDROM. = 1.0010

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
FLYASH CONC. GM/100ML = *****

* * SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	N-205	CARD NUMBER	2	CARD NUMBER	3
DATE	5/27/70	WINDROX ST, H2O	0.8000E 01	N.G. FLOW, SCALE	0.9800E 02
TIME	1530	BURNER DP, H2O	0.6000E 01	N.G. STATIC, R.O.	0.9400E 01
PRI. AIR ST, HG	0.1400E 01	FURN. ST, H2O	0.2000E 01	SCREW SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2600E 01	PP EXIT ST, HG	-0.1600E 01	O2 FURN. EX. E-BM	0.3000E 01
SEC. AIR ST, HG	0.1200E 01	PP EXIT DP, H2O	0.5500E 01	COMB. FURN. EX. %	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.2200E 01	ELE. CHEM. FILVCLT	0.0
		PEEPSITF DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BARGMETRIC, HG	0.2895E 02

CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.4000E 02	TEMP. FURN. RECORDER, F		TEMP. CONTINUED	
PART. LOAD, PSIG	0.4200E 02	SEC. AIR CRIF.	0.1200E 03	PART. SCRUB. IN	0.3800E 03
ABS NOZ., PSIG	0.2500E 02	WINDBOX-TOP	0.7600E 03	#1 CRIFICE	0.1300E 03
ABS LOAD, PSIG	0.5000E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1300E 03
ABS CRIF. INCH	0.4200E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.8500E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7500E 03	AIR HEATER #2	0.8500E 03
MANOMETER CODE	0	NO.1 BANK CUT	0.6800E 03	PRI. AIR FAN IN.	0.8900E 02
		NO.2 BANK CUT	0.5800E 03	PRI. AIR WGT BULB	0.6700E 02
CARD NUMBER	7	FURN. EXIT	0.4800E 03	SEC. AIR FAN IN.	0.6500E 02
MODE CF OPER.	3	CCAL-AIR	0.1200E 03	SEC. AIR NET BULB	0.5600E 02
PART. SCR. ST, HG	-0.2000E 00				
PART. SCR. DP, H2O	0.5000E 01	CARD NUMBER	8	CARD NUMBER	9
PART. CYC. DP, H2O	0.4800E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.1000E 01
#1 CRIF. ST, HG	-0.6000E 00	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 CRIF. DP, H2O	0.4400E 01			FBA DP, H2O	0.5400E 01
				FBA DEMIST. DP, H2O	0.1000E 01

CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 CRIFICE	0.1300E 03	PART. CYC. EXIT	0.1300E 03	PART. INIT. GAL	0.1366E 06
FBA INLET	0.1280E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.1368E 06
FBA EXIT	0.1270E 03	PART. CYC. SUMP	0.1320E 03	PART. TIME, MIN	0.3500E 02
P. P. EXIT	0.1270E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.4949E 05
PART. CYC. SUMP	0.1270E 03	FBA SUMP	0.1300E 03	ABS H2O FI. GAL	0.4953E 05
ABS CYC. SUMP	0.0	MGO SLAK TANK	0.0	ABS H2O TIME, MIN	0.3500E 02
FBA SUMP	0.1270E 03	MGOH2 TANK	0.8000E 02	MGO ROTO. SCALE, %	0.7400E 02
MGO SLAK TANK	0.0			MAKEUP SETTING	0.7400E 02
MGOH2 TANK	0.8100E 02				
MAKEUP WATER	0.6200E 02				

RUN NUMBER N-205

DATE 5/27/70

TIME OF DAY 1530

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/H	DEW POINT F	DRY FLOW #/HR	STAT PPHS IN. H2O
PRIMARY AIR	518.	120.0	---	---	---	---	0.010	62.2	513.	19.0
SECONDARY AIR	4797.	747.5	---	---	---	---	0.009	57.5	4756.	8.0
FURNACE EXIT	5745.	480.0	3215.2	---	---	---	0.052	112.8	5462.	2.2
PART.SCRB.INLET	5745.	380.0	---	---	---	---	0.052	112.8	---	-2.7
PART.CYC.EXIT	5801.	130.0	3202.9	---	---	---	0.081	126.3	5366.	-8.1
VENT ABS.INLET	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
ABS CYC.EXIT	*****	*****	*****	*****	*****	*****	*****	*****	---	*****
FLOATING BED IN	5801.	128.0	*****	*****	*****	*****	0.081	126.3	---	-13.5
FLOATING BED EX	6395.	127.0	*****	*****	*****	*****	0.076	123.1	---	-21.7
P.P. EXIT ORIF.	6395.	127.0	44.2	*****	*****	*****	0.076	123.1	5941.	-21.7

SCRUBBER STREAM DATA

	TEMP,F	FLOW,GPM	GAS ABSORBER	VENTURI ABSORBER	FBA
PARTICULATE	62.0	4.91	MAKEUP WATER	TEMP,F FLOW,M/M	TEMP,F FLOW,M/M
MAKEUP WATER	132.0	5.09	MAKEUP MGO SL.	*****	62.0 3.7
PRODUCT LIQ.	132.0	23.15	PRODUCT LIQ.	6.4	81.0 7.3
RECIRCULATED LIQ.			REC.(SPRAY NOZ.)	*****	130.0 12.8
			REC.(FLOW NOZ.)	*****	130.0 377.1
				*****	426.3

FURNACE PERFORMANCE

HEAT RELEASE,BTU/HR	0.570E 07
% FUEL AS COAL	96.5
COAL FLOW RATE,#/HR	452.2
NAT.GAS FLOW,#/HR	8.9
% EXCESS AIR	14.3
OXYGEN, % DRY, MEAS.	3.00
CO2, % DRY-CALC.	15.48
HUMIDITY, #/H - CALC.	0.052

SCRUBBER PERFORMANCE

SO2 ABSORB.EFF	0.38
FLYASH COL.EFF	*****
SO3 ABSORB.EFF	*****
NOX ABSORB.EFF	*****
GAS VELOCITY,FPS	152.0
LIQ/GAS,GAL/MCF	15.4
LIQ/GAS, #/H	2.0
PRES.DROP, IN.WG	5.0

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2,	=	*****
SULFITE/SO2-MOL/MOL	=	*****
SUMP RESID.TIME,MIN	=	*****

FLOATING BED ABSORBER

KGA, #MOLE/HR-FT2	=	52.6
SULFITE/SC2-MOL/MOL	=	7.88
SUMP RESID.TIME,MIN	=	28.5

SULFATE FORMATION PARAMETERS

CONC., GR-MOLF/L	=	0.5310
MOL% TOTAL SULF	=	55.52
O2 AT FURN. EX.	=	3.00
O2 AT ABSORB.IN	=	*****
O2 AT ABSORB.EX	=	*****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER N-205

DATE 5/27/70

TIME OF DAY 1530

MATERIAL BALANCES

FURNACE	SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROG.
INPUT, #/HR	16.73	-----	33.46	263.6	5454.	INPUT FLOWS, #ATOMS/100#FEED
OUTPUT, #/HR	18.31	-----	*****	282.7	5462.	CARBON 0.479766
						HYDROGEN 0.562025
PART. SCRUBBER						OXYGEN 1.302801
INPUT, #/HR	18.31	-----	*****	2742.	5462.	NITROGEN 5.044308
OUTPUT, #/HR	17.91	-----	*****	2983.	5366.	SULFUR 0.009125
						FEED RATE, #/SEC = 1.59
SO2 ABSORBERS						ENTHALPY, BTU/# = 394.
INPUT, #/HR	17.91	19.73	*****	1362.	5366.	
OUTPUT, #/HR	24.61	17.98	*****	1123.	5541.	

*SO2 ABSORBERS- PRODUCT COMP.

	GM SO2/ 100ML	GM-MOLE/ LITER	GRAM/ 100ML	MAKEUP MGO COMPOSITION
TOTAL,	2.94	0.4597	-----	SLURRY CONC. - GM MGO/100ML = 7.50
COMBINED	2.84	0.4435	-----	MGO PRESLEAKED, NO=0, YES=1 0
FREE	0.10	0.0162	-----	% SLAKED TO Mg(OH)2, YEAS. = *****
MONO(TOTAL)	2.73	0.4273	-----	
MONO(DISSOLVED)	1.22	0.1906	-----	PRODUCT MGO BASE PHYSICAL PROPERTIES
MONO(SOLID)	1.51	0.2367	1.982	ACID STRENGTH, PH = 6.20
BISULFITE	1.24	0.0969	5.018	SP. GRAVITY, HYDRON. = 1.1150
MGO	0.0	0.0	1.802	
SULFATE	3.40	0.5310	0.0	
MAGNESIUM	6.24	0.9745	6.372	
FLYASH	-----	-----	-----	PARTICULATE SCRUBBER PRODUCT
SOLIDS, MG	-----	-----	*****	ACID STRENGTH, PH = *****
			6.192	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	0-206	CARD NUMBER	2	CARD NUMBER	3
DATE	7/21/70	WINDBOX ST,H2O	0.1120E 02	N.G. FLOW,SCALE	0.0
TIME	1435	BURNER DP,H2O	0.5700E 01	N.G. STATIC,R.G.	0.0
PRI.AIR ST, HG	0.1400E 01	FURN. ST,H2O	0.5400E 01	SCREEN SPEED,RPM	0.4000E 03
PRI.AIR DP,H2O	0.2250E 01	PP EXIT ST,HG	-0.1700E 01	02 FURN.EX,X-BX	0.4000E 01
SEC.AIR ST,HG	0.1600E 01	PP EXIT DP,H2O	0.4600E 01	COMB.FURN,EX,%	0.0
SEC.AIR DP,H2O	0.2300E 01	FURN.EX,ST,H2O	0.4800E 01	ELE.CHEM,NILVOLT	0.0
		PEEPSITE DP,HG	0.0	CELL TEMP,F	0.0
		P.SITE ST,PSIG	0.0	BAROMETRIC,HG	0.2912E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART.NDZ.,PSIG	0.3800E 02	TEMP.FURN.RECORDER,F		TEMP.CONTINUFD	
PART.LOAD,PSIG	0.3800E 02	SEC.AIR ORIF.	0.1300E 03	PART.SCRUB.IN	0.4750E 03
ABS NDZ.,PSIG	0.2600E 02	WINDBOX-TOP	0.7750E 03	#1 ORIFICE	0.1400E 03
ABS LOAD,PSIG	0.3800E 02	WINDBOX-BEST	0.7350E 03	FBA INLET	0.1200E 03
ABS ORIF.INCH	0.4500E 01	WINDBOX-BOT.	0.7400E 03	AIR HEATER #1	0.8550E 03
ABSORBER NDZ. CODE	1	WINDBOX-EAST	0.7600E 03	AIR HEATER #2	0.8200E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8550E 03	PRI.AIR FAN IN.	0.7500E 02
		NO.2 BANK OUT	0.7300E 03	PRI.AIR OUT BULB	0.7500E 02
CARD NUMBER	7	FURN. EXIT	0.6150E 03	SEC.AIR FAN IN.	0.7000E 02
MODE OF OPER.	3	COAL-AIR	0.1050E 03	SEC.AIR NET BULB	0.7000E 02
PART.SCR.ST,HG	0.5000E 00				
PART.SCR.DP,H2O	0.8400E 01	CARD NUMBER	8	CARD NUMBER	9
PART.CYC.DP,H2O	0.5700E 01	VENT.ABS.DP,H2O	0.0	FBA INLET ST,HG	-0.7000E 00
#1 ORIF.ST,HG	-0.6000E 00	ABS CYC.DP,H2O	0.0	FBA SUMP DP,H2O	0.1000E 01
#1 ORIF.DP,H2O	0.4000E 01			FBA DP,H2O	0.7400E 01
				FBA DEMIST.DP,H2O	0.2000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP.PILOT RECORDER,F		TEMP.THERMOMETERS,F		MAKEUP FLLWS	
#1 ORIFICE	0.1400E 03	PART.CYC.EXIT	0.1420E 03	PART.INIT.GAL	0.3831E 05
FBA INLET	0.1400E 03	ABS CYC.EXIT	0.0	PART.FINAL,GAL	0.3835E 05
FBA EXIT	0.1350E 03	PART.CYC.SUMP	0.1400E 03	PART.TIME,MIN	0.1060E 02
P.P.EXIT	0.1350E 03	ABS CYC.SUMP	0.0	ABS H2O IN,GAL	0.1000E 01
PART.CYC.SUMP	0.1350E 03	FBA SUMP	0.1420E 03	ABS H2O FI,GAL	0.1100E 01
ABS CYC.SUMP	0.7600E 02	MGO SLAK TANK	0.1400E 03	ABS H2O TIME,MIN	0.6000E 02
FBA SUMP	0.1360E 03	MGOH2 TANK	0.1300E 03	MGO ROTO.SCALE,%	0.3130E 03
MGO SLAK TANK	0.1350E 03			MAKEUP SETTING	0.3130E 03
MGOH2 TANK	0.1280E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER 0-206

DATE 7/21/70

TIME OF DAY 1435

MATERIAL BALANCES

INPUT FOR EQ. - KIN. PROG.
 INPUT FLOWS, #ATOMS/100#FEED
 CARBON 0.461036
 HYDROGEN 0.608546
 OXYGEN 1.396141
 NITROGEN 5.051247
 SULFUR 0.008547

FURNACE
 INPUT, #/HR 16.10
 OUTPUT, #/HR *****

WATER 297.9
 DRY GAS 5367.
 5385.

PART. SCRUBBER
 INPUT, #/HR *****
 OUTPUT, #/HR 10.55

2139.
 2940.
 5385.
 4985.

SO2 ABSORBERS
 INPUT, #/HR 10.55
 OUTPUT, #/HR 108.76

1955.
 1724.
 4985.
 5258.

FEED RATE, #/SEC = 1.56

ENTHALPY, BTU/# = -2004.

*
 *SO2 ABSORBERS-
 PRODUCT COMP.

TOTAL, 2.60
 COMBINED 2.18
 FREE 0.42
 MONO(TOTAL) 1.76
 MONO(DISSOLVED) 1.72
 MONO(SOLID) 0.04
 BISULFITE 0.0
 MGO 0.0
 SULFATE 10.87
 MAGNESIUM 13.05
 FLYASH -----
 SOLIDS, MG -----

MAKEUP MGO COMPOSITION

SLURRY CONC. - GM MGO/100ML = 1.52
 MGO PRESLAKED, NO=0, YES=1 C
 % SLAKED TO MG(OH)2, MEAS. = *****

PRODUCT MG BASE PHYSICAL PROPERTIES

ACID STRENGTH, PH = 7.50
 SP. GRAVITY, HYDROM. = 1.2540

PARTICULATE SCRUBBER PRODUCT

ACID STRENGTH, PH = *****
 FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON 0.7150
 HYDROGEN 0.0485
 OXY+NIT 0.0817
 SULFUR 0.0370
 ASH 0.0740
 WATER 0.0438

*
 *SOLIDS FREE BASIS, MASS/VOLUME SOLUTION

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - INPUT DATA PAGE1

TEST NUMBER	0-207	CARD NUMBER	2	CARD NUMBER	3
DATE	7-21-70	WINDBOX ST, H2O	0.1140E 02	N.G. FLUX, RSCALE	0.0
TIME		BURNER DP, H2O	0.5600E 01	N.G. STATIC, R.U.	0.0
PRI. AIR ST, HG	0.1400E 01	FURN. ST, H2O	0.5300E 01	SCREEN SPEED, RPM	0.4000E 03
PRI. AIR DP, H2O	0.2200E 01	PP EXIT ST, HG	-0.1700E 01	U2 FURN. EX. 2-BM	0.3600E 01
SEC. AIR ST, HG	0.1600E 01	PP EXIT DP, H2O	0.4700E 01	COMB. FURN. EX. 2	0.0
SEC. AIR DP, H2O	0.2300E 01	FURN. EX. ST, H2O	0.4800E 01	ELE. CHEM. FILVCLT	0.0
		PEEPSITE DP, HG	0.0	CELL TEMP, F	0.0
		P. SITE ST, PSIG	0.0	BAROMETRIC, HG	0.2912E 02
CARD NUMBER	4	CARD NUMBER	5	CARD NUMBER	6
PART. NOZ., PSIG	0.3800E 02	TEMP. FURN. RECORDER, F	0.1360E 03	TEMP. CONTINUFD	
PART. LOAD, PSIG	0.3800E 02	SEC. AIR ORIF.	0.7600E 03	PART. SCRUB. IN	0.4750E 03
ABS NOZ., PSIG	0.2600E 02	WINDBOX-TUP	0.7400E 03	#1 ORIFICE	0.1400E 03
ABS LOAD, PSIG	0.3800E 02	WINDBOX-WEST	0.7400E 03	FBA INLET	0.1400E 03
ABS ORIF. INCH	0.4500E 01	WINDBOX-ROT.	0.7400E 03	AIR HEATER #1	0.8550E 03
ABSORBER NOZ. CODE	1	WINDBOX-EAST	0.7600E 03	AIR HEATER #2	0.8200E 03
MANOMETER CODE	0	NO.1 BANK OUT	0.8600E 03	PRI. AIR FAN IN.	0.7500E 02
		NO.2 BANK OUT	0.7400E 03	PRI. AIR WGT BULB	0.7500E 02
CARD NUMBER	7	FURN. EXIT	0.6150E 03	SEC. AIR FAN IN.	0.7000E 02
MCDE OF OPER.	3	COAL-AIR	0.1050E 03	SEC. AIR WET BULB	0.7000E 02
PART. SCR. ST, HG	0.5000E 00	CARD NUMBER	8	CARD NUMBER	9
PART. SCR. DP, H2O	0.8300E 01	VENT. ABS. DP, H2O	0.0	FBA INLET ST, HG	-0.7000E 00
PART. CYC. DP, H2O	0.5700E 01	ABS CYC. DP, H2O	0.0	FBA SUMP DP, H2O	0.1000E 01
#1 ORIF. ST, HG	-0.6000E 00			FBA DP, H2O	0.7300E 01
#1 ORIF. DP, H2O	0.4000E 01			FBA DEMIST. DP, H2O	0.2000E 01
CARD NUMBER	10	CARD NUMBER	11	CARD NUMBER	12
TEMP. PILOT RECORDER, F		TEMP. THERMOMETERS, F		MAKEUP FLOWS	
#1 ORIFICE	0.1400E 03	PART. CYC. EXIT	0.1500E 03	PART. INIT. GAL	0.3843E 05
FBA INLET	0.1420E 03	ABS CYC. EXIT	0.0	PART. FINAL, GAL	0.3848E 05
FBA EXIT	0.1370E 03	PART. CYC. SUMP	0.1400E 03	PART. TIME, MIN	0.1250E 02
P. P. EXIT	0.1350E 03	ABS CYC. SUMP	0.0	ABS H2O IN. GAL	0.1000E 01
PART. CYC. SUMP	0.1360E 03	FBA SUMP	0.1420E 03	ABS H2O FI. GAL	0.1100E 01
ABS CYC. SUMP	0.7800E 02	MGU SLAK TANK	0.1400E 03	ABS H2O TIME, MIN	0.6000E 02
FBA SUMP	0.1360E 03	MGUH2 TANK	0.1300E 03	MGU ROTG. SCALE, %	0.3130E 03
MGO SLAK TANK	0.1350E 03			MAKEUP SETTING	0.3130E 03
MGUH2 TANK	0.1280E 03				
MAKEUP WATER	0.6000E 02				

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM-OUTPUT DATA PAGE 1

RUN NUMBER G-207

DATE 7-21-70

TIME OF DAY

FLUE GAS DATA

	FLOW #/HR	TEMP. F	SO2 PPM	SO3 PPM	NOX PPM	FLYASH GR/DSCF	HUM. #/#	CEM POINT F	DPY FLOW #/HR	STAT PSES IN. H2O
PRIMARY AIR	483.	105.0	-----	-----	-----	-----	0.019	81.0	474.	19.0
SECONDARY AIR	4765.	750.0	-----	-----	-----	-----	0.017	77.6	4686.	11.4
FURNACE EXIT	5661.	615.0	*****	*****	*****	*****	0.056	115.9	5360.	4.0
PART. SCRUB. INLET	5661.	475.0	*****	*****	*****	*****	0.056	115.9	-----	6.3
PART. CYC. EXIT	5429.	150.0	2048.6	*****	*****	*****	0.057	132.2	4951.	-8.1
VENT. ABS. INLET	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
ABS. CYC. EXIT	*****	*****	*****	*****	*****	*****	*****	*****	-----	*****
FLOATING BED IN	5429.	142.0	*****	*****	*****	*****	0.097	132.2	-----	-3.5
FLOATING BED EX	5849.	137.0	*****	*****	*****	*****	0.093	129.3	-----	-23.0
P.P. EXIT ORIF.	5849.	135.0	502.9	*****	*****	*****	0.093	129.3	5354.	-23.0

SCRUBBER STREAM DATA

	TEMP, F	FLOW, GPM	GAS ABSORBER	VENTURI ABSORBER	FDA
PARTICULATE					
MAKEUP WATER	60.0	4.00	MAKEUP WATER	TEMP, F FLOW, #/N	TEMP, F FLOW, #/N
PRODUCT LIQ.	140.0	4.92	MAKEUP MCG SL.	*****	60.0 0.0
RECIRCULATED LIQ.	140.0	22.52	PRODUCT LIQ.	6.4	128.0 25.0
			REC. (SPRAY NLZ)	*****	142.0 26.0
			REC. (FLOW NLZ.)	*****	142.0 326.0
				*****	441.2

FURNACE PERFORMANCE

HEAT RELEASE, BTU/HR	0.539E 07
% FUEL AS COAL	100.0
COAL FLOW RATE, #/HR	442.7
NAT. GAS FLOW, #/HR	0.0
% EXCESS AIR	17.1
OXYGEN, % DRY, MEAS.	3.60
CO2, % DRY-CALC.	15.12
HUMIDITY, #/# - CALC.	0.056

SCRUBBER PERFORMANCE

SO2 ABSORB. EFF	*****
FLYASH COL. EFF	*****
SO3 ABSORB. EFF	*****
NOX ABSORB. EFF	*****
GAS VELOCITY, FPS	147.6
LIQ/GAS, GAL/MCF	15.4
LIQ/GAS, #/#	2.1
PRES. DROP, IN. WG	8.3

VENT ADS.

VENT ADS.	*****
*****	75.45
*****	*****
*****	*****
*****	*****
*****	12.5
*****	33.0
*****	4.5
*****	7.3

VENT ADS.

VENT ADS.	*****
*****	75.45
*****	*****
*****	*****
*****	*****
*****	12.5
*****	33.0
*****	4.5
*****	7.3

SO2 ABSORPTION PARAMETERS

VENTURI ABSORBER

KGA, #MOLE/HR-FT2, = *****
 SULFITE/SC2-MCL/MOL = *****
 SUMP RESID. TIME, MIN = *****

FLOATING BED ABSORBER

KGA, #MCLC/HR-FT2 = 15.6
 SULFITE/SC2-MOL/MOL = 13.20
 SUMP RESID. TIME, MIN = 4.4

SULFATE FORMATION PARAMETERS

CONC., GM-HOLE/L = 2.7042
 MOL % TOTAL SULF = 91.10
 O2 AT FURN. EX. = 3.00
 O2 AT ABSORB. IN. = *****
 O2 AT ABSORB. EX. = *****

***** MEANS ITEM NOT MEASURED

MAGNESIUM BASE SLURRY SCRUBBING PROGRAM - OUTPUT DATA PAGE 2

RUN NUMBER 0-207

DATE 7-21-70

TIME OF DAY

MATERIAL BALANCES

FURNACE		SULFUR	MAGNESIUM	FLYASH	WATER	DRY GAS	INPUT FOR EQ. - KIN. PROC.
INPUT, #/HR	16.38	-----	-----	32.76	301.0	5341.	INPUT FLOWS, #ATOMS/100#FED
OUTPUT, #/HR	*****	-----	-----	*****	301.0	5360.	CARBON 0.470829
PART. SCRUBBER		*****	-----	*****	2303.	5360.	HYDROGEN 0.616968
INPUT, #/HR	10.58	-----	-----	*****	2941.	4951.	OXYGEN 1.394998
OUTPUT, #/HR	*****	-----	-----	*****			NITROGEN 5.052231
SO2 ABSORBERS		10.58	7.35	*****	1966.	4951.	SULFUR 0.009137
INPUT, #/HR	155.85	111.94	*****	*****	1555.	5354.	FEED RATE, #/SEC= 1.56
OUTPUT, #/HR	*****	*****	*****	*****			ENTHALPY, BTU/# = -3189.

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*SO2 ABSORBERS- PRODUCT COMP.

TOTAL,	1.68	GM SO2/	GRAM/	MAKEUP MGO COMPOSITION
COMBINED	1.18	100ML	100ML	SLURRY CONC. - GM MGO/100ML = 0.82
FREE	0.50	LITER	-----	MGO PRESLAKED, MG=0, YES=1 0
MONO(TOTAL)	0.68		-----	% SLAKED TO MG(OH)2, MEAS. = *****
MONO(DISSOLVED)	1.14		-----	
MONO(SOLID)	-0.46		-----	PRODUCT MG BASE PHYSICAL PROPERTIES
BISULFITE	0.52		1.852	ACID STRENGTH, PH = 4.90
MGO	0.0		-1.523	SP. GRAVITY, HYDROM. = 1.2850
SULFATE	17.31		0.756	
MAGNESIUM	18.49		0.0	
FLYASH	-----		32.450	PARTICULATE SCRUBBER PRODUCT
SOLIDS, MG	-----		*****	ACID STRENGTH, PH = *****
			0.052	FLYASH CONC. GM/100ML = *****

COAL COMPOSITION-MASS

CARBON	0.7150
HYDROGEN	0.0485
OXY+NIT	0.0817
SULFUR	0.0370
ASH	0.0740
WATER	0.0438

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*SOLIDS FREE BASIS, MASS/VOLUME SOLUTION